Eastern States Residency Conference
Conference Book
May 16-19, 2022
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**Presenter Name:** AlDoughaim, Maha  
**Organization:** Boston Medical Center  
**Category:** Ambulatory Care  
**Day | Session | Room | Time:** Tuesday | 4 | Crystal A | 4:15:00 PM

**Authors:** Maha AlDoughaim, Jessica Freydman, Simon Gorelikov, Kimberly Tsou, Radhika Jhaveri, David Hughes

**Title:** Optimizing Clinic Efficiency Using a Pharmacist-Managed Iron Deficiency Anemia Service in an Ambulatory Oncology Clinic

**Objectives:** At Boston Medical Center, eligible iron deficiency anemia (IDA) patients from all specialties are referred to a hematologist for iron infusions. The high demand for hematologist appointments resulted in a wait time of eight weeks from referral to visit for patients with any hematology indication. In addition, not having a standardized procedure for selecting iron formulations resulted in insurance issues, treatment delays and increased chair time. This quality improvement project aims to develop a pharmacist run service to increase the efficiency of iron infusion clinic.

**Methods:** Patients 18 years of age and older requiring iron infusions for IDA are referred for management under a pharmacy run protocol in an outpatient clinic. Pharmacists will assess labs, select intravenous iron formulations, dose and schedule appropriate follow-ups under a scope of practice with an attending hematologist. Plan-Do-Study-Act cycles will be implemented to assess change over time. Cycle one was the initiation of a clinic pilot for referrals from hematology providers. Upcoming cycles will incorporate expansion to inpatient and outpatient providers from outside clinics. Outcome measures include the number of patients with an iron formulation change upon referral, chair time saved and provider time offset. Process metrics include the number of patients managed by a pharmacist and the percentage of visits with appropriate labs as outlined in the standard operating procedure. Balancing metrics will include the number of infusion-related reactions, incidence of hypophosphatemia and time spent by pharmacists. Data will be collected prospectively every two weeks and represented as control charts following the Institute of Healthcare Improvement Model.

**Results:** The pharmacist run iron clinic went live on February 1, 2022. Since implementation, forty-eight patients who met the inclusion criteria were referred from hematology providers. All patients were scheduled for iron infusions and labs. Treatment plans were entered into the electronic medical record. Based on the patients return to clinic timing on referral, 39 of the referrals will be seen in the next 6 months by a pharmacist, amounting to a predicted estimate of 80 visits that will be offset from the referring provider.
**Conclusions:** A pharmacist driven iron clinic was successfully implemented. This quality improvement project will continue to contribute to a more streamlined workflow for patients with iron deficiency anemia at Boston Medical Center and will aid in future development of similar pharmacist driven practices.
Impact of pharmacist-led education on provider initiation of glucagon-like peptide-1 receptor agonists in overweight or obese patients with type 2 diabetes in a family medicine clinic

Authors: Elise Kim, PharmD, BCACP, CDCES; Timothy Amin, PharmD

Title: Impact of pharmacist-led education on provider initiation of glucagon-like peptide-1 receptor agonists in overweight or obese patients with type 2 diabetes in a family medicine clinic

Objectives: Glucagon-like peptide-1 receptor agonists (GLP-1 RAs) are not only effective in improving glycemic control in type 2 diabetes mellitus (T2DM), but also have extra-pancreatic effects such as aiding in weight loss by decreasing satiety and gastric emptying. By educating and assisting providers in optimal patient and agent selection, ambulatory care pharmacotherapy specialists can increase utilization of GLP-1 RAs to potentially help patients with T2DM lose weight. The objective of this study is to determine the impact of pharmacist-led education on GLP-1 receptor agonist initiation in overweight or obese patients with T2DM within a family medicine clinic.

Methods: In this single-center, prospective, quality improvement study, pharmacotherapy specialists and residents developed informational guides to educate primary care providers (PCPs) on GLP-1 RAs. Study personnel also generated daily reports of eligible patients which were distributed to providers. Adult patients with T2DM, a BMI ≥ 25 kg/m2, a PCP appointment in the preceding two years, and not already on a GLP-1 RA were included. GLP-1 RA prescribing practices from these eligible patients will subsequently be quantified.

Results: The number of patients prescribed a GLP-1 RA out of eligible patients screened will be recorded and results will be presented.

Conclusions: It is anticipated that this project will demonstrate a positive impact of pharmacist-led education on the initiation of GLP-1 RAs in patients with type 2 diabetes who are overweight or obese.
Evaluation of Prolia Adherence and Clinical Outcomes at SBH Health System

Objectives: One in two women and one in four men will experience an osteoporosis-related fracture in their lifetime. Adherence to osteoporosis medications is an important factor in the successful treatment of osteoporosis and prevention of osteoporosis-related fractures. Unfortunately, with injectable medications requiring administration by trained healthcare professionals, such as prolia, adherence may be the main rate limiting step in the successful treatment of patients. Prolia is a monoclonal antibody requiring administration every 6 months. It works by preventing osteoclast formation, decreasing bone resorption, and increasing bone mass. The objectives of this study are to evaluate whether patients initiated on prolia who experienced a fall/fracture had a delay in therapy that if resolved perhaps could have prevented the fall/fracture. Our goal with this evaluation is to identify gap areas contributing to patients initiated on prolia being lost to follow-up, with the ultimate goal of one day opening an osteoporosis clinic at SBH Health System.

Methods: Medical records of patients who received prolia from February 1st, 2019 to November 1st, 2021 were reviewed. In this study, patients 18 years and older who received at least one dose of prolia were included and patients less than 18 years of age were excluded.

Results: The following measures will be assessed: number of prolia doses received, duration of time passed between prolia doses, presence of calcium/vitaminD supplementation while on prolia, presence of DEXA scans performed on patients prior to and 2 years post prolia initiation, scheduling of prolia follow-up doses, and number of visits to the emergency department for osteoporosis-related fractures.

Conclusions: It is anticipated that the results of this assessment will show a significant number of patient's lost to follow-up or non-adherent to prolia. The results of this study will be used to identify gap areas contributing to this loss of follow-up and delays in therapy, with the ultimate goal of one day opening an osteoporosis clinic at SBH Health System, assisting with the closing of these gaps and improvement of clinical outcomes in our osteoporosis population.
**Objective:** Despite newer agents coming to market, most available bisphosphonates—namely alendronate, risedronate, and zoledronic acid—have demonstrated broad-spectrum protection against vertebral, non-vertebral, and hip fractures. These medications remain first-line options for the treatment and prevention of osteoporosis. Ibandronate on the other hand is only appropriate in reducing the risk of vertebral fractures. Nonetheless, we have noticed a high utilization of ibandronate, warranting both an assessment of the appropriateness of these prescriptions, and the distribution of pharmacist-to-provider education.

**Methods:** A chart review has been conducted to screen patients who are actively prescribed ibandronate from select primary care offices with established pharmacy integration. Ibandronate prescriptions have been evaluated for appropriateness based on the patients' most recent DEXA scan results and calculated 10-year fracture risk score via the Fracture Risk Assessment Tool (FRAX). After identifying qualifying interventions, standardized recommendations will be sent to providers, followed by the distribution of educational material regarding the appropriate management of osteoporosis to help navigate appropriate prescribing of antiresorptive medications.

**Results:** Results to be reported include the percentage of recommendations accepted by primary care providers and the percentage of ibandronate prescriptions that are prescribed appropriately. Of the 118 patients screened, 83 were included in the assessment, and ibandronate was determined to be appropriately prescribed in 12 patients (14%). Of the remaining patients, a broad-spectrum antiresorptive agent was considered to be more appropriate for 54 patients (65%), a repeat DEXA scan was necessary to assess the appropriateness of ibandronate in 11 patients (13%), a bisphosphonate holiday was appropriate for five patients (6%), and one patient (1%) had a miscellaneous intervention.

**Conclusions:** It is anticipated that this project will highlight the role for pharmacist-driven osteoporosis co-management and pharmacist-led education.
Comparison of COVID-19 vaccination and infection rates in adult patients with autoimmune inflammatory disease on b/tsDMARD therapy

**Objectives:** Patients with autoimmune inflammatory rheumatic disease (AIIRD) are at an increased risk of infection due to the underlying etiology of their disease as well as treatment with immunosuppressive disease-modifying anti-rheumatic drugs (DMARDs). The purpose of this study is to determine the efficacy of COVID-19 vaccines in reducing the incidence of COVID-19 infection in a real-world population on biologic (bDMARD) and targeted synthetic (tsDMARD) therapy, defined as a positive SARS-CoV-2 PCR test. Considering the evolving guideline updates, timeframe, and variants, we hypothesize that patients receiving b/tsDMARD therapy have a diminished antibody immune response and thus a higher risk of breakthrough COVID-19 infection despite appropriate primary series vaccination.

**Methods:** Study subjects were identified as adults prescribed a b/tsDMARD by a University of Rochester (UR) Allergy/Immunology/Rheumatology (AIR) outpatient provider between March 1, 2020 and June 1, 2021. Subjects meeting inclusion criteria were stratified into vaccinated or partially vaccinated/unvaccinated cohorts based on appropriateness of vaccine administration per CDC guidelines. Data was collected regarding demographics, PCR test, b/tsDMARD therapy, concurrent medications, type of COVID-19 vaccination, and COVID-19 infection outcomes through September 1, 2021. Data analysis was completed to compare COVID-19 infection rates and stratifying patients by vaccination type and b/tsDMARD therapy class.

**Results:** A total of 1,940 patients were included in the study. The majority of patients were Caucasian (88.0%), females (65.7%), with a median age of 57. The most common AIIRD was rheumatoid arthritis (49.2%) and 66.4% of patients were on a TNF inhibitor. Within this population, 1,416 (73.0%) patients were vaccinated and 524 (27.0%) were unvaccinated. Of the 58 patients with a positive COVID-19 PCR result, a significantly higher incidence occurred in the unvaccinated/partially vaccinated group (9.4%) compared to vaccinated group (0.6%). There were 10 patients hospitalized with a COVID-19-related ICD-10 code, all of which were unvaccinated, indicating a 20% hospitalization rate. One unvaccinated patient passed away within the study period.
Conclusions: The vaccination rates within the study were higher compared to administration rates in the New York Finger Lakes region (59.5%) as of the study’s last date of follow-up. Higher incidence of COVID-19 infection and hospitalization in the unvaccinated cohort supports the efficacy of primary series vaccination, even in patients that may have diminished immune responses. Additional studies may aim to evaluate impacts of subsequent vaccine doses and evaluate longevity of protection following vaccination.
Title: Assessing an Anticoagulation Bridging Service in a Perioperative Interdisciplinary Clinic

Objectives: Perioperative anticoagulation management is complex and requires clinicians to balance the risk of both bleeding and thrombosis before, during, and after surgery. We hypothesized that a pharmacist-managed anticoagulation bridging service would be beneficial for patients undergoing surgery at The Johns Hopkins Hospital. A pilot program was initiated in August 2020 in partnership with the Center for Perioperative Optimization (CPO). The primary objectives of this project are: (1) to describe the patients who were managed by the CPO Anticoagulation Bridging Service (ACBS), (2) to describe the patient interventions performed by the CPO ACBS, (3) to assess and compare clinical outcomes of the patients who did and did not receive CPO ACBS services, and (4) to develop recommendations regarding the resources needed to sustain and expand the service.

Methods: A single-center retrospective cohort study was conducted for all patients referred to the CPO ACBS from August 2020 to August 2021 compared to a historical control cohort from August 2019 to August 2020. Patients identified by the CPO requiring consultation for planned surgeries were referred to the ACBS to be managed by a pharmacist in consultation with a hematologist. Patients 18 and older were included in the study if they were on an anticoagulant, had a planned procedure scheduled, and were referred to the CPO ACBS. A standardized form was used by a pharmacist to collect patient information from the electronic medical record (EMR) to develop a bridging plan. The plan was discussed with a hematologist and surgeon for approval. The pharmacist educated the patient regarding the bridging plan via telephone and documented the encounter in the EMR. Descriptive statistics will be used to outline patient demographics and to summarize outcomes.

Results: We plan to describe the demographic and clinical characteristics of the intervention and control groups including the types of procedures and perioperative management of anticoagulation. We will also report the rate of clinical outcomes for both groups including symptomatic perioperative bleeding and thrombotic events from 1-week pre-operation until 30 days post procedure.

Conclusions: Conclusions are pending data analysis. Further work to quantify direct costs in terms of increased length of stay, extra procedures required due to bleeding or thrombosis, and
the level of care required post-operative discharge will help determine the financial justification for continuing and potentially expanding this program.
**Title:** Liver Function Test Elevations in Adults with Cystic Fibrosis Taking Elexacaftor/Tezacaftor/Ivacaftor

**Objective:** Cystic Fibrosis (CF) Transmembrane Conductance Regulator modulators are a cornerstone of CF treatment. However, many CF patients develop CF Liver Disease (CFLD) over time and previous data indicate a risk for Liver Function Test (LFT) elevation with modulator use. Elexacaftor/Tezacaftor/Ivacaftor (ELX/TEZ/IVA) is a commonly prescribed modulator given broad efficacy among CF genomic profiles. Theoretically ELX/TEZ/IVA drug induced liver injury (DILI) could exacerbate and further worsen CFLD but holding modulators can cause decline in clinical status. There is a lack of quality data to assess the risk benefit profile of modulators if DILI occurs.

**Methods:** This IRB-approved retrospective study included all adults with CF who have been prescribed ELX/TEZ/IVA at the University of Vermont Medical Center. The primary outcome was incidence of LFT elevation >3X upper limit of normal (ULN). Secondary outcomes were LFT elevations ≥25% baseline, days to LFT elevation and resolution, clinical decision making, adherence measured by proportion of days covered (PDC), incidence of maximum bilirubin >2 mg/dL, and consultation of a hepatologist. Data were stratified by both LFT elevation >3x ULN and ≥25% baseline. Demographics, past medical history, concomitant medications, and social history were compared to identify potential risk factors for LFT elevation.

**Results:** 83 patients were prescribed ELX/TEZ/IVA. Of the 9 (10.8%) that experienced an elevation >3X ULN median days to elevation was 108, 4 elevations resolved, median days to resolution was 197, therapy was held in 2, dose was modified in 2, therapy was never discontinued, hepatology was consulted in 6, bilirubin was >2 mg/dL in 1, and median PDC was 91.6. CFLD diagnosis was higher among those with an elevation >3x ULN (62.5% vs 24.3 % p=0.036). Of the 62 (74.7%) that experienced an elevation ≥25% baseline median days to elevation was 135, 36 elevations resolved, median days to resolution was 186, therapy was held in 2, dose was modified in 4, therapy was discontinued in 2, hepatology was consulted in 18, bilirubin was >2 mg/dL in 3, and median PDC was 91. Median baseline ALT was lower (24 vs 32 p=0.018) and median days of therapy (733 vs 675 p=0.047) was longer among those with...
an elevation ≥25% baseline. Bilirubin was >2 mg/dL in 5 patients (6%). Regardless of LFT elevation status 5 patients (6%) experienced a bilirubin elevation > 2 mg/dL.

**Conclusions:** LFT elevation among adults taking ELX/TEZ/IVA was common but rarely resulted in discontinuation. Risk factors for LFT elevation were not identified due to sample size but incidence of CFLD diagnosis was higher among those with elevations > 3X ULN and median days of therapy was longer among those with elevations ≥25% baseline.
**Objectives:** Uncontrolled type 2 diabetes mellitus (T2DM) is associated with various complications including micro and macro-vascular complications, impaired immunity, and neurologic ailments. Therefore, adequate blood glucose control is essential to prevent future complications. Another common chronic disease affecting Americans is hypertension (HTN). According to the Centers for Disease Control and Prevention (CDC) about 50% of hypertensive individuals do not achieve adequate blood pressure control. Furthermore, several studies have identified HTN and T2DM as risk factors for polypharmacy, especially in the geriatric population. This study is aimed at evaluating the impact of pharmacist-led interventions in reducing 90-day all-cause hospitalizations, hemoglobin A1c (A1c), systolic blood pressure (SBP), and the number of inappropriately prescribed medications in the ambulatory care setting.

**Methods:** For this prospective pre-post interventional study, a report in the electronic health record was generated to identify study participants meeting the study's inclusion criteria (adults with SBP>140mmHg or A1c>9% and taking >3 medications). Interventions provided by the pharmacist during monthly follow-up visits included: patient counseling, comprehensive medication review, and medication regimen adjustment per a collaborative practice agreement protocol. The primary outcome for this study was the mean difference in 90-day all-cause hospitalization between the pre- and post-intervention periods. The secondary outcomes compared the mean difference in SBP, A1c, and the number of inappropriate medications de-prescribed between the pre- and post-intervention periods. A student t-test will be used to calculate the mean difference for the primary and secondary outcomes.

**Results:** Preliminary data favors pharmacist interventions in lowering SBP and de-prescription of inappropriate medications; however, full data analyses are pending.

**Conclusions:** It is anticipated that this study will demonstrate the benefit of pharmacist interventions in addressing improvement in the management of HTN, T2DM, and polypharmacy in the ambulatory care setting.
Conference Abstracts
May 16-18, 2022

Presenter Name: Bock, Nicole
Organization: Inspira Medical Center Mullica Hill
Category: Ambulatory Care
Day | Session | Room | Time: Wednesday | 6 | Crystal A | 3:30:00 PM

Authors: N. Bock, J. Beach, L. Pino, C. Zampitella, M. Theis; Inspira Health and Thais Health, Mullica Hill, New Jersey

Title: Pharmacist led intervention in hypertension management using remote patient monitoring

Objectives: This study is to determine if pharmacist intervention for patients with hypertension currently using remote patient monitoring services via Thais allows them to meet blood pressure goals faster and more efficiently than traditional treatment. The primary investigator of this study has partnered with Thais, a remote patient monitoring company, to track real-time blood pressure data for patients enrolled in their program. As an extension of a patient's health care team, Thais predicts and prevents health emergencies by improving the care and health of patients, leading to reduction in Emergency Department costs.

Methods: All patients for this study had uncontrolled hypertension and were selected to participate by their primary care providers in Inspira Medical Group (IMG). Each patient was given the option to accept or decline the program with Thais. Each week the Inspira Population Health Data Analyst sent a list of patients new to the program with Thais to the pharmacist. The baseline blood pressure was determined by taking the average of the patient's first three days of enrollment in the program. The pharmacist contacted the patient via telephone after receiving 2 weeks of new blood pressure data. All recorded blood pressures were saved, but only the baseline, 7-day average at day 45 and 7-day average at day 90 were documented in the worksheet for the study. Before the outreach the pharmacist reviewed the patient’s chart and makes any recommendations necessary to the referring physician based on current hypertension guidelines and blood pressure goals by American College of Cardiology (ACC) and American Heart Association (AHA). The pharmacist documented all interventions and time to blood pressure goal.

Results: The COVID-19 pandemic has caused challenges to the methods of this study due to the need for written consent from patients. The study will continue into 2023.

Conclusions: It is anticipated that intervention in treatment regimens by the pharmacist will have beneficial outcomes to patients; including the time to blood pressure goal.
Presenter Name: Braham, Mary Jane  
Organization: WVU Medicine  
Category: Ambulatory Care  
Day | Session | Room | Time: Tuesday | 3 | Magnolia D | 1:30:00 PM

Authors: Mary Jane Braham, PharmD; Jordan Carter, PharmD, MS; Karly Dancsecs, PharmD, MBA, BCPS; Marc Phillips, PharmD, CPHQ, Dan O'Neil, PharmD, MS, BCPS

Title: Implementation of an analytics software to support automated dispensing machine operational efficiency and quality

Objectives: The purpose of this quality improvement project is to evaluate the effect of the implementation of a pharmacy analytics program on operational efficacy at an academic medical center.

Methods: Twenty-five automated dispensing machines (ADMs) at an academic medical center located in the emergency department (n=3), adult patient care areas (n=16), and the intensive care units (n=6) were identified for cabinet optimization. Omnicell One, a data analytics program associated with the Omnicell OmniCenter technology platform, was utilized for optimization of identified ADMs. Optimization of each cabinet involved three steps: (1) assessing medication utilization in each cabinet during the previous year, (2) adjusting par levels (desired on-hand inventory levels) for each ADM, and (3) transferring medications to alternate locations based upon identified utilization. The primary objective of this quality improvement project was to optimize medication distribution in ADMs by evaluating six key performance indicators: (1) cost of expired medications from ADMs, (2) vend-to-fill ratio, (3) medication stock outs, (4) total inventory cost per ADM, (5) medication overrides, and (6) pharmacy technician time spent at ADMs.

Results: Pre-implementation data will be recorded and presented.

Conclusions: It is anticipated that this project will allow for optimization of ADMs at an academic medical center and in turn optimize identified key performance indicators.
The Impact of Continuous Subcutaneous Insulin Infusion, Continuous Glucose Monitoring, and Practice Structure on Clinical Outcomes in Patients with Diabetes

Objectives: The primary objective of this study is to compare time in range as well as percentage for severe hypoglycemia (<50mg/dL) for the three major insulin pump devices (Medtronic, Tandem, and Omnipod). The current literature has shown that IP treatment has led to improvements in glycemic control as well as decreased hypoglycemic events when compared to MDI. From a financial perspective, IP therapy has been associated with an increase in mean annual cost of approximately $13,000 dollars shared between patients and health insurance (approximately $3000 dollars more than MDI). As a result, many insurance plans do not allow patients to change between different pumps until a specified period of time which points to a current gap in literature comparing the outcomes using the three major insulin pumps. Given that patients typically sign a long-term agreement, it warrants information on which pumps may suit patient's best and which ones will provide the best outcomes.

Methods: This is a retrospective chart review that will analyze approximately 300 diabetic patients from a combination of 3 primary care offices between the years of 2015 to 2021. Individual patients will be analyzed from the most recent 12 months of insulin pump utilization. The primary endpoint of the study is to determine if one of the three major insulin pumps provide superior clinical outcomes in regards to time in range as well as percentage of severe hypoglycemia. Eligible patients include type1 or type 2 diabetes patients who are using an insulin pump within the study period. Patients will be excluded if they were pregnant during the study period or if they use an insulin pump device without a continuous glucose monitor. Patient's charts will be analyzed as well as cloud-based pump report sites including: CareLink (for patients on Medtronic pumps), T-connect (for patients on Tandem pumps), and Glooko (for patients on Omnipod pumps). Secondary objectives for this study include: 1) comparing outcomes (time in range/percent sever hypoglycemia) for patients who are managed by pharmacist/endocrinologist collaboration versus pharmacist/PCP collaboration, 2) factors associated with clinic

Results: A total of 300 patients charts from 2015 through August 31st 2021 will be reviewed and analyzed in order to determine if there is a significant difference in outcomes between the
three study groups. Comparative analysis for the primary objective will be completed using ANOVA statistical tests. This study is currently in progress and results have not been produced at the time of abstract submission.

**Conclusions:** Insights from this study may provide useful information for wider implementation of insulin pumps in specific populations yielding to better outcomes. If successful, this research will contribute to the existing knowledge base by providing literature on ways to potentially optimize clinical outcomes for patients, practice management, and healthcare related costs.
**Authors:** Charlotte Brochu, PharmD; Monica Akus PharmD, BCPS, DPLA; Garrett Lech PharmD, BCACP, DPLA

**Title:** Impact of pharmacist-led hypertension quick connect (HTN-QC) program on hypertension management through in-person care and remote patient monitoring

**Objectives:** The COVID-19 pandemic has disproportionately affected our patients at Cambridge Health Alliance (CHA), which services communities with the highest race and poverty disparities across Massachusetts, and has further highlighted barriers to chronic disease management. In response to decreasing hypertension control at CHA, the Hypertension Quick Connect (HTN-QC) program was piloted to increase access to hypertension management beginning in June 2021 through a hybrid of in-person and remote monitoring including validation of home or loaned BP monitors, education on technique, and medication management. The objectives of this quality improvement project are to determine the impact of the HTN-QC program on hypertension management and to assess the utilization of targeted access to Pharmacotherapy-run hypertension visits.

**Methods:** A retrospective chart review was conducted of patients 18-84 years old with a diagnosis of hypertension who were referred to Pharmacotherapy for hypertension management and have completed at least one HTN-QC visit. Data was collected from July 1, 2021 to March 1, 2022. The primary outcome is the percentage of patients with controlled hypertension (BP <140/90). Secondary outcomes include average change in systolic BP (SBP) and diastolic BP (DBP), number of visits to achieve controlled BP, and number of visits available versus completed. Other data to be collected includes: number of referrals per month, number of televisits versus in-person visits, and no-show rate. In addition, an anonymous survey was administered to a random sample of patients to assess their experience with HTN-QC.

**Results:** 417 patients were included in the analysis. Among all patients seen by HTN-QC, 72.4% (302/417) of patients achieved hypertension control with an average change of -6.9mmHg in SBP and -2.1mmHg in DBP. Limiting to patients with ≥2 HTN-QC visits, 72.9% (173/237) of patients achieved hypertension control with an average change of -11.7mmHg in SBP and -3.6mmHg in DBP. Additional secondary outcomes will be recorded and results will be presented at Eastern States Residency Conference.

**Conclusions:** This preliminary analysis demonstrates that HTN-QC achieved high rates of hypertension control among patients with initially elevated BP whether only one or multiple
follow-ups were performed. This suggests that oftentimes a singular follow-up on an elevated BP is beneficial for hypertension care and is an area where pharmacists can provide value, in addition to providing repeated follow-up on patients with more difficult to control hypertension. Assessment of utilization data and patient feedback will aid in targeting improvements to the HTN-QC program moving forward.
Impact of a pharmacist-led methotrexate counseling and monitoring service on prescribing rates of apremilast and biologics in psoriasis and atopic dermatitis patients

Objectives: Methotrexate is a more cost-effective option than biologics for psoriasis and atopic dermatitis treatment. In April 2021, a pharmacist-led methotrexate counseling and monitoring service was implemented in collaboration with dermatologists to encourage and support the prescribing of methotrexate before apremilast or biologics for patients with psoriasis or atopic dermatitis. This study provides comparative data on the impact of this service and prescribing patterns of apremilast and biologics in patients with psoriasis and atopic dermatitis.

Methods: Adults with psoriasis or atopic dermatitis referred to the pharmacist-led methotrexate counseling and monitoring service between April 30, 2021 and October 31, 2021 not on biologics at the time of referral were included in the study group. The comparator group included adults with psoriasis or atopic dermatitis using at least one topical therapy at the time of referral to dermatology from April 1, 2019 to October 31, 2019. A retrospective chart review was conducted using the electronic medical record. The primary endpoint was the percentage of patients that required escalation to biologics at 3- and 6- months after referral to the methotrexate counseling and monitoring service versus patients referred to dermatology. Secondary outcomes include assessment of adherence, patient-reported skin clearing, and adverse effects to methotrexate. The chi-squared test and descriptive statistics were used to analyze the primary outcome and secondary outcomes, respectively.

Results: A total of 58 patients were included in this study (n=29 in the study group; n=29 in the comparator group). The percentage of patients who required escalation to a biologic at 3 months was 13.8% and 27.5% in the study group and comparator group, respectively (p = .19). The percentage of patients who required escalation to a biologic at 6 months was 10.3% and 3.4% in the study group and control group, respectively (p = .3). 51.7% of patients in the study group reported improvement in skin clearing post-methotrexate initiation. Side effects and insufficient response were the most frequent reasons for methotrexate discontinuation in the study group at 3 and 6 months, respectively.

Conclusions: Patients referred to the pharmacist-led methotrexate counseling and monitoring service were less likely to be escalated to biologics at 3 months compared to patients not
referred to the service. Further research with a larger sample size and longer study duration may be needed.
Presentation Title: Evaluation of pharmacist-driven continuous glucose monitoring service in a medical resident-run clinic for type 2 diabetes patients

Objectives: Continuous glucose monitoring (CGM) is widely used to help optimize diabetes management and is currently recommended in the American Diabetes Association guidelines. The opportunities and challenges to implement a CGM service can vary based on clinic type. The objective of this study is to evaluate the impact of a newly implemented pharmacist-driven CGM service in a medical resident-run internal medicine clinic in patients with type 2 diabetes.

Methods: This is a single-center retrospective cohort study in which electronic medical records were reviewed for patients enrolled in the new pharmacist CGM service at the Johns Hopkins Outpatient Center (JHOC) Medical Clinic between September 15, 2021 to January 31, 2022. Adult patients with type 2 diabetes with a baseline hemoglobin A1c > 7% were included while pregnant patients or those with type 1 diabetes, gestational diabetes, latent autoimmune diabetes, or who were lost to follow-up were excluded. The percentage time in range and A1c prior to and three months following their enrollment into the pharmacist CGM service were compared, and descriptive analysis was utilized to describe the data collected from the electronic medical record.

Results: There were seven patients with an initial pharmacist visit during the study period. The pharmacotherapy interventions, lifestyle recommendations, barriers to CGM usage, and patients' reasons for continuation of CGM will be presented.

Conclusions: It is anticipated that this project will demonstrate the impact of a newly implemented pharmacist-driven CGM service in a medical resident-run clinic.
Examining the association between COVID-19 infection and worsening diabetes mellitus

**Objectives:** There is little published evidence regarding how COVID-19 infection can affect the comorbidities that patients have post-infection. It is hypothesized that being infected with COVID-19 may worsen glycemic control in patients with diabetes. The aim of this study is to examine the effect of being infected with COVID-19 on glycemic control in patients with diabetes.

**Methods:** A pre-post within-subject design was used to evaluate the effect that infection with COVID-19 has on glucose control in patients with diabetes mellitus. Participants in the study were patients at one of the four Baystate Health System outpatient clinics who had an ICD 10 diagnosis code for type 1 or type 2 diabetes in their electronic medical record. To be included in the study, patients needed to be at least eighteen years old and have a positive COVID-19 test documented in their electronic medical record during the study period (March 1, 2020 through June 30, 2021). The primary outcome was change in A1c from the beginning of the study period through COVID-19 infection and follow up period post-infection. Secondary outcomes include change in weight from the beginning of the study period through COVID-19 infection and follow up period post-infection. Baseline demographic data to be collected will include age, sex, comorbidities, and weight. Patients with type 1 diabetes will be evaluated separately from patients with type 2 diabetes. For all outcomes, our focus will be on reporting effect sizes and measures of variability as an exploration of potentially important clinical effects.

**Results:** There are currently 386 initially eligible patients enrolled in the study. Results were not available at the time of this writing, but we expect to present baseline characteristics, change in baseline A1c, and change in baseline weight following infection with COVID-19.

**Conclusions:** It is anticipated that patients with diabetes had worsening glycemic control following infection with COVID-19. More research needs to be done evaluating whether these results were solely due to being infected with COVID-19 or if the socioeconomical constraints of the pandemic contributed in part. It is likely that the pandemic influenced these results and that pharmacists can play a part in increasing adherence to diabetes therapies and lifestyle changes in patients with diabetes.
Pharmacist-led vaccine reconciliation in a rheumatology clinic

Objectives: Vaccination efforts have decreased morbidity and mortality rates from diseases such as hepatitis B virus (HBV), pneumonia, and tetanus. The Advisory Committee on Immunization Practices (ACIP) and Center for Disease Control (CDC) state that vaccination is crucial for patients who are immunocompromised, including those using disease modifying anti-rheumatic drugs (DMARDs) or chronic corticosteroids. This study aimed to identify the resources required for effective implementation of a pharmacist-driven vaccination service in a rheumatology clinic.

Methods: This study was conducted by performing prospective chart reviews to recommend appropriate vaccines for patients who had scheduled visits at the PPMC rheumatology clinic from 10/1/2021 to 10/15/2021. Baseline characteristics such as age, gender, diagnosis, and use of DMARD(s) were collected if applicable. Test claims were processed through prescription insurance plans for eligible vaccines to identify which vaccines could be dispensed by the onsite health system pharmacy. The embedded clinical pharmacist met with patients during scheduled provider visits to complete a vaccine reconciliation and identify any vaccines that were completed, but not yet appropriately documented in the electronic health record (EHR). Patients were then provided with recommendations for any incomplete vaccinations per ACIP and CDC guidelines. The primary outcome of this study was to determine the percentage of patient prescription insurance plans that covered recommended vaccines. Secondary outcomes included confirmed eligible number and type of vaccines, as well as time spent per patient.

Results: The study included 205 patients. The most frequently recommended vaccines following chart review were for the prevention of influenza (99%), tetanus (52%), and shingles (50%). However, due to discrepancies identified during the in-person vaccine reconciliation between the EHR and patient self-report, fewer patients than anticipated were eligible to receive influenza (77%), tetanus (45%), and shingles (43%) vaccines. The percentage of prescription insurance plans that covered recommended vaccines varied; 33% covered HBV, 50% covered MMR and pneumonia, 57% covered influenza, 73% covered tetanus, and 76% covered shingles. Overall vaccine reconciliation work-up required an average of 32 minutes per patient.

Conclusions: Rheumatology patients may benefit from pharmacist-led vaccination services to ensure completion of recommended vaccines. Completion of these vaccines at onsite health
system pharmacies may generate revenue through prescription insurance reimbursement seen in this study. The embedded clinical pharmacist’s skills and expertise are ideal to determine vaccine eligibility, obtain accurate immunization history, and administer incomplete vaccines.
Effectiveness and safety of direct oral anticoagulants in venous thromboembolism and advanced chronic kidney disease

**Objectives:** The direct oral anticoagulants (DOACs) are first line for the treatment of venous thromboembolism (VTE). Warfarin remains the mainstay recommendation in patients with renal disease and creatinine clearance less than 30 mL/min (i.e., advanced chronic kidney disease [ACKD]) given the reliance of DOACs on renal elimination and lack of validated monitoring parameters. Data comparing warfarin and DOACs in the setting of ACKD have focused on patients with atrial fibrillation and otherwise remains limited. The objective of this study is to describe the effectiveness and safety of DOACs compared to warfarin for the treatment of VTE among patients with a CrCl less than 30 ml/min.

**Methods:** Patients with a VTE and ACKD from six integrated healthcare systems who were dispensed a DOAC (dabigatran, rivaroxaban, apixaban, or edoxaban) or warfarin between January 1, 2016 and December 31, 2020 were included in this retrospective, matched, longitudinal cohort study. A propensity model to have received a DOAC was constructed. Patients who received a DOAC were matched up to 1:5 to patients who received warfarin on their propensity score. The primary outcome was the composite of systemic thromboembolism including ischemic stroke, clinically-relevant bleeding, and all-cause mortality. Secondary outcomes include the individual components of the composite outcome. Outcomes were validated by manual chart review. Kaplan Meier curves were used to estimate the survival function. Multivariable, conditional proportional hazards modeling was used to assess differences between groups.

**Results:** A total of 626 patients who received a DOAC were matched to 1071 patients who received warfarin. Study outcomes by anticoagulation status among patients with a VTE and CrCl less than 30 mL/min will be presented.

**Conclusions:** It is anticipated that this project will add to the current literature available regarding DOAC use for the treatment of VTE in patients with ACKD.
**Conference Abstracts**  
May 16-18, 2022

**Presenter Name:** Cohen, Lexi  
**Organization:** Coatesville Veterans Affairs Medical Center  
**Category:** Ambulatory Care  
**Day | Session | Room | Time:** Tuesday | 4 | Crystal A | 4:30:00 PM

**Authors:** Cohen L, Lutteroty B, von Vital M; Coatesville Veterans Affairs Medical Center, Coatesville, PA

**Title:** De-escalation of inhaled corticosteroids in veterans with chronic obstructive pulmonary disease at a community-based outpatient clinic (CBOC)

**Objectives:** Chronic obstructive pulmonary disease (COPD) treatment involves the use of short and long-acting beta agonists, muscarinic antagonists and inhaled corticosteroids (ICS). In patients with a history of exacerbations, combining ICS and long-acting beta agonists is effective in improving lung function and reducing exacerbations. However, ICS therapy carries the risk of adverse effects including pneumonia, oral candidiasis, and diminished bone density. Thus, ICS use should be reserved for patients with severe COPD symptoms. Many patients are prescribed ICS therapy for COPD management and are not continually re-evaluated to determine if ICS use is appropriate based on current symptoms and exacerbation history. The purpose of this project is to evaluate the appropriateness of ICS therapy of patients enrolled on a CBOC primary care team and de-escalate therapy for those who do not have an appropriate clinical indication for use.

**Methods:** Eligible veterans were contacted via telephone to conduct a comprehensive assessment of patient's COPD history including symptom assessment using quantitative assessment methods, exacerbation/hospitalization history, and review of current COPD regimen. During this visit, patients were determined to be eligible or ineligible for ICS de-escalation based on recommendations from the 2021 Global Initiative for Chronic Obstructive Lung Disease (GOLD) Guidelines. Those deemed eligible were then referred to a pharmacist-run outpatient clinic for de-escalation. A follow up telephone phone call was conducted within 2 months post de-escalation for reassessment of COPD symptoms.

**Results:** Thirty-eight patients from the CBOC primary care team were identified as being prescribed an ICS with concurrent COPD diagnosis. Data collection is ongoing and will be presented upon completion.

**Conclusions:** It is anticipated that this project will assist in the development and utilization of a systematic approach to de-escalate ICS therapy to improve therapeutic outcomes for our veteran patients. It is also expected to demonstrate a role for pharmacist-based patient assessment to help optimize COPD management.
Conference Abstracts  
May 16-18, 2022

Presenter Name: Crocetta, Nicholas  
Organization: Albany College of Pharmacy and Health Sciences/ Community Care Physicians, P.C.  
Category: Ambulatory Care  
Day | Session | Room | Time: Tuesday | 3 | Crystal A | 12:15:00 PM

Authors: Nicholas Crocetta, B.S., PharmD; Kyle Guay, PharmD, BCGP; Alexandra Watson, PharmD, BCACP

Title: Evaluation of a pharmacist's impact on the use of glucagon-like peptide-1 receptor agonists for weight management

Objectives: Glucagon-like peptide-1 receptor (GLP-1) agonists when used for weight management, carry benefits and risks that must be evaluated prior to use and monitored throughout therapy. Pharmacists possess the accessibility and extensive medication knowledge to evaluate these factors and assist with initiating and monitoring GLP-1 therapy in patients seeking weight management treatment. The objective of this study is to evaluate the clinical and financial impact of a clinical pharmacist directed weight management service utilizing GLP-1 receptor agonists on patient outcomes.

Methods: A retrospective chart review including patients at two family medicine practices, aged 18 and older, prescribed liraglutide or semaglutide for weight loss based on body mass index of 30 kg/m2 or BMI of 27 kg/m2 and presence of weight-related co-morbid conditions between October 1st, 2021 to March 1st, 2022 was performed. Data points collected included patient sex, age, ethnicity, race, initial BMI, initial body weight, GLP-1 agent selected, final body weight, and final BMI. Patients who met inclusion and were prescribed a weight loss agent but were not followed by a clinical pharmacist were identified, separated from, and compared to patients who received weight management assistance from a clinical pharmacist. Descriptive statistics and inferential statistics were used in the data analysis. A paired t-test was used in the inferential analysis.

Results: There was a total of 46 patients followed by a clinical pharmacist and 60 patients followed by their primary care physician for weight management identified. Patients receiving pharmacy services achieved a mean body weight reduction of 9.32% compared to a 5.11% body weight reduction for patients not followed by pharmacy services ($p=0.01$). There was a total of 191 months of inappropriate GLP-1 therapy prescribed identified for patients not followed by clinical pharmacy, resulting in an estimated cost of $309,194.62. There was a total of 63 months of inappropriate GLP-1 deprescribed in the pharmacist led group resulting in an estimated cost savings of $101,985.66.
**Conclusions:** The implementation of a pharmacist led weight management clinic resulted in a statistically significant reduction in body weight and a reduction in total costs to the healthcare system compared to patients receiving weight management services from their primary care physician alone.
**Conference Abstracts**  
May 16-18, 2022

**Presenter Name:** Duong, Amy  
**Organization:** University of Rochester Medical Center - Strong Memorial Hospital; UR Medicine Primary Care Network  
**Category:** Ambulatory Care  
**Day | Session | Room | Time:** Tuesday | 3 | Crystal A | 1:30:00 PM

**Authors:** Amy Duong, PharmD; Samantha Heacock, PharmD; Sarah Amering, Pharm D, BCACP; Lillian Brennan, PharmD; Jineane Venci, PharmD, MS-CI; Nicole Acquisto, PharmD

**Title:** Real world impact of 3 mg and 4.5 mg doses of dulaglutide on weight in patients with type 2 diabetes mellitus

**Objectives:** The AWARD-11 trial led to the approval of dulaglutide 3 mg and 4.5 mg doses for the treatment of type 2 diabetes mellitus (T2DM). However, there is limited real-world data on the benefits and risks associated with these higher doses, making it difficult to determine if there is clinical utility in titrating patients currently managed on dulaglutide 1.5 mg weekly. The purpose of this study was to determine the real-world impact of dulaglutide 3 mg and 4.5 mg weekly on weight and hemoglobin A1c (HbA1c) in patients with T2DM.

**Methods:** This was a retrospective, observational study of adult patients within the UR Medicine Primary Care Network who had a diagnosis of T2DM and were treated with dulaglutide 3 mg or 4.5 mg weekly. Patients with an active (re-filled at least once) prescription for dulaglutide 3 mg or 4.5 mg between September 2020 and June 2021 were included. The primary outcome was change in weight (kg) from baseline at 8-12 weeks, 13-24 weeks, 25-36 weeks and 37-52 weeks; stratified according to highest dulaglutide dose received. Secondary outcomes included change in HbA1c (%) from baseline and describing trends and patterns related to dose reductions. A paired t-test was used to evaluate the mean difference from baseline to each time interval for weight and HbA1c.

**Results:** A total of 111 patients were included; median age 61 (IQR 52 to 70) and 55% male. When compared to the 1.5 mg weekly dose of dulaglutide, patients prescribed 3 mg weekly had a mean weight difference of -2.7 kg (95% CI 0.9 to 4.6, p=0.006) and a mean HbA1c reduction of -0.8% (95% CI 0.2 to 1.4, p=0.01) at study conclusion (52 weeks). In patients that were further increased to the maximum dose of 4.5 mg weekly, additional reductions in weight (-2.9 kg [95% CI 0.4 to 5.4, p=0.024]) and HbA1c (-0.1% [95% CI -0.5 to 0.7, p=0.701]) were seen at 52 weeks, when compared to the 3 mg weekly dose. The number of patients who experienced an adverse event, required a dose reduction, or discontinued therapy were 8 (11.9%), 4 (6%), and 1 (1.5%) in the 3 mg group and 4 (9.1%), 1 (2.3%), and 5 (11.4%) in the 4.5 mg group, respectively.
Conclusions: In patients with T2DM, continued reductions in weight and HbA1c were seen with each dose increase of dulaglutide and were sustained throughout the duration of the study. Larger incremental changes in weight and HbA1c were seen in patients increasing from 1.5 mg to 3 mg versus patients increasing from 3 mg to 4.5 mg. Pharmacists may play a role in promoting the use of higher doses of dulaglutide to further improve weight and A1c reductions. Rate of reported adverse events and dose reductions were higher in the 3 mg group, but therapy discontinuations were more frequent in the 4.5 mg group.
Evaluation of osteoporosis treatment in patients treated with raloxifene

**Objectives:** Osteoporosis (OP) is a prevalent disease characterized by presence of fragility fracture and/or decreased bone mineral density, placing individuals at an increased risk for fractures. The National Osteoporosis Foundation (NOF) determined that many patients with osteoporosis-related fractures are not receiving appropriate therapy. Recent guidelines published by the American Association of Clinical Endocrinologists (AACE) highlight bisphosphonates and denosumab as primary treatment options. Raloxifene is an alternative agent used to treat osteoporosis, however limited evidence supporting its overall efficacy prompted a downgrade within recent guidelines from its previous recommendations. Raloxifene use also carries additional risks of venous thromboembolism (VTE) and cardiovascular events through its Black Box Warnings. This study sought to evaluate patients currently treated with raloxifene for osteoporosis and their eligibility to transition to preferred pharmacotherapy in accordance with recent guideline recommendations.

**Methods:** A retrospective chart review was conducted of patients at Penn Medicine Lancaster General Health (LGH) who filled prescriptions for raloxifene from June 1, 2020 to May 31, 2021. Patients were included if they were at least 18 years of age, had an active raloxifene prescription on their medication list within the electronic health record (EHR), had a diagnosis of osteopenia or osteoporosis in the EHR, and the current prescriber of raloxifene practiced within the health system. Data collection included patient demographics, bone density imaging via dual-energy X-ray absorptiometry (DEXA) scan, duration of raloxifene therapy, history of osteoporosis treatment(s), hospitalizations for raloxifene-attributed black box warning events, and barriers to preferred pharmacotherapy. The primary endpoint was the percentage of patients eligible for potential transition from raloxifene to a guideline-recommended first-line therapy. Secondary endpoints included percentage of provider acceptance of recommendations, class of transitioned therapy, time to provider response, and number of thromboembolic events seen.

**Results:** The number and percentage of patients eligible for transition to preferred osteoporosis therapy and secondary endpoints will be recorded. Results will be presented.
Conclusions: Results will be utilized to highlight opportunities for osteoporosis pharmacotherapy optimization and shape future prescribing practices to benefit patients.
Impact of practice structure on clinical outcomes of diabetic patients using a continuous subcutaneous insulin infusion pump and continuous glucose monitor

**Objective:**
The aim of this study is to determine if there are any differences in clinical outcomes in patients using a continuous subcutaneous insulin delivery system and continuous glucose monitor managed by primary care and a pharmacist or endocrinology specialist and pharmacist.

**Methods:**
This research study was a retrospective chart review of diabetic patients with a continuous subcutaneous insulin delivery system who either received management collaboratively by primary care and a pharmacist or endocrinology and a pharmacist in the year 2021. Data from two different health systems were evaluated. Participants were included if they were 18 years or older, had a diagnosis of type 1 or type 2 diabetes, and used a continuous subcutaneous insulin delivery system with a continuous glucose monitor. Patients were excluded if they were not using a CGM, pregnant, CKD stage 4, 5, or on dialysis. The primary outcome is to compare differences in A1C between cohorts. The secondary outcome is to compare the following CGM glycemic parameters: time in range, time in hypoglycemia, time in severe hypoglycemia. Student's T-test analysis was used to assess the differences between continuous variables between the two cohorts.

**Results:**
In total there were 74 patients in the endocrinology cohort, and 69 patients in the primary care cohort. Change in A1C from baseline was statistically significant in the patients managed by endocrinology-pharmacy. Differences in time in range, time in hypoglycemia, and time in hyperglycemia did not differ significantly between cohorts.

**Conclusions:**
The data suggests that a practice structure with an endocrinologist alongside a clinical pharmacist resulted in improved A1C. However, other clinical outcomes time in range, time in hypoglycemia, and time in hyperglycemia did not differ significantly.
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Implementation of a pharmacist run polypharmacy clinic in a family practice setting

**Presenter Name:** Gelen, Brenna  
**Organization:** Shenandoah University  
**Category:** Ambulatory Care  
**Day | Session | Room | Time:** Tuesday | 4 | Wild Rose B | 3:00:00 PM

**Authors:** Brenna Gelen, PharmD; R. Iain Pritchard, PharmD, BCACP; Marcia Brackbill, PharmD, BCPS

**Title:** Implementation of a pharmacist run polypharmacy clinic in a family practice setting

**Objectives:** With an aging US population, polypharmacy - the use of 5 or more medications - is becoming more common. One way that ambulatory care practitioners can work together to address medication-related needs of the older population is to capitalize upon the expertise of the pharmacist. The goal of this study was to describe interventions made by the ambulatory-based clinical pharmacist in a newly implemented polypharmacy clinic.

**Methods:** This was a retrospective, descriptive study to assess the number and types of interventions pharmacists made at a newly implemented polypharmacy clinic. Patients were included in the study if they participated in the clinic between November 1, 2021 and February 15, 2022. Pharmacist interventions were grouped into 1 of 9 number of categories: deprescribing of potentially inappropriate medications, deprescribing of Beers List medications, drug-drug/food/herbal interactions, duplication of therapy, incorrect dose (dose too high or low), untreated disease state, cost effective alternative, and administration adjustments. The number of interventions were tracked using an Excel spreadsheet that contained date seen in the clinic and number of medications prior to appointment. The primary endpoint was the number of interventions per patient and number of interventions total per disease state. Other endpoints collected included demographic data, number of medications prior to appointment, number of overall recommendations, and number of accepted recommendations.

**Results:** Recommendations were broken down and categorized into the types of recommendation as noted above. A tally of the total number of recommendations for each type was also kept. The results will be presented at the Eastern States Conference.

**Conclusions:** It is anticipated the implementation of a pharmacist led polypharmacy clinic in a family practice setting was successful. The pharmacist made at least one intervention per visit and the majority of recommendations were accepted by physicians.
Development of a whole health pathway for patients with diabetes

Objective: Patient engagement and satisfaction with care are significant factors in the success of recommended treatment plans. For patients with diabetes specifically, addressing the various factors that may contribute to glycemic control and overall well-being is vital in developing a successful therapeutic plan. The purpose of this project was to develop a Whole Health pathway for patients with diabetes to provide education on the different domains of health, and incorporate these domains into therapeutic plans during follow-up regarding diabetes management.

Methods: Patients with new onset or established diagnosis of type 1 or type 2 diabetes mellitus receiving care from Lebanon VAMC clinical pharmacy practitioner managed diabetes clinics were referred to the Whole Health program to complete introductory education sessions. Clinical pharmacy practitioners were educated on the services offered through the Whole Health program, and how to refer patients to this pathway. Information from the patient's personal health inventory (PHI) was used to guide care plans during follow-up for diabetes management in pharmacy-run clinics. Patient satisfaction was evaluated through patient surveys. Primary outcomes are average change in A1c for patients involved in the Whole Health pathway, and patient satisfaction with care provided through this pathway. Secondary outcomes are difference in A1c change for patients involved in the Whole Health pathway compared to patients not enrolled in the pathway, and patients’ perceived changes of medication adherence after enrollment in the pathway.

Results: Average change in A1c, patient satisfaction scores, and perceived changes in medication adherence will be evaluated and presented.

Conclusions: It is anticipated that the project will demonstrate a benefit for patients with diabetes when enrolled in the whole health program, to improve outcomes as well as patient satisfaction with care.
Conference Abstracts  
May 16-18, 2022

Presenter Name: Green, Jonathan  
Organization: VA Maryland Health Care Systems  
Category: Ambulatory Care  
Day | Session | Room | Time: Wednesday | 5 | Crystal A | 1:15:00 PM

Authors: Jonathan Green, PharmD; Christina Dickson, PharmD; Rohini Dave, PharmD, BCIDP

Title: Implementation of a pharmacy-led medication management clinic using the VIONE approach for deprescribing in a HIV primary care clinic at a Veterans affairs hospital

Objectives: Polypharmacy is increasingly recognized as a significant barrier to the treatment of HIV infection and to the quality of life of patients who are affected. Patients on antiretroviral therapy for management of HIV are at increased risk for chronic non-infectious comorbid diseases, often resulting in addition of medications. At the VA Maryland Health Care System (VAMHCS), there is currently no pharmacist dedicated solely to addressing polypharmacy in our Veterans with HIV. The purpose of this project is to incorporate a pharmacist in the optimization of medication regimens in our Veteran population with HIV through use of the deprescribing tool VIONE.

Methods: The pharmacist will recruit patients from the primary care HIV clinic that have a VIONE risk score ≥ 4, indicative of being at high risk for polypharmacy related adverse events, and have ≥ 10 medications. Patients eligible will be contacted and scheduled for an initial visit (in person or via video telehealth) to conduct a thorough medication reconciliation. The second visit will involve use of the VIONE approach to make adjust and deprescribe as appropriate. The pharmacist will adhere to their defined scope of practice, which includes prescriptive authority, to assess and make these changes. Providers will be notified of these changes via co-signature of notes in the electronic medical record. Subsequent visits will be used to follow up with the patient and assess the effects of deprescribing and any changes made. The number and percentage of medication deprescribed in the clinic will be collected.

Results: N/A

Conclusions: N/A
**Presenter Name:** Gublo, Bernadette

**Organization:** Providence Veteran Affairs Medical Center

**Category:** Ambulatory Care

**Day | Session | Room | Time:** Poster

**Authors:** B. Gublo, A. St Amand; Providence Veteran Affairs Medical Center, Providence, Rhode Island

**Title:** Evaluation of empagliflozin's effect on reducing blood pressure in type 2 diabetic Veterans with chronic kidney disease and/or heart failure

**Objectives:** Hypertension is commonly seen in patients with diabetes and can lead to severe cardiovascular complications and kidney disease if treated inadequately. Diabetic patients are at higher cardiovascular risk, which is why effective glycemic and blood pressure control is vital to prevent serious and sometimes life-threatening micro and macrovascular complications. American Diabetes Association Guidelines recommend SGLT2-inhibitors in patients with established atherosclerotic cardiovascular disease (ASCVD), kidney disease or heart failure (HF), independent of A1C.1 Although empagliflozin has demonstrated its cardiovascular and renal benefits in previous trials, whether empagliflozin can consistently reduce blood pressure is not well studied. Therefore, by conducting a study that analyzes the impact of empagliflozin on reducing blood pressure in a hypertensive diabetic population with CKD and/or HF, it may promote the use of empagliflozin for diabetes control, enhanced blood pressure management, and provide end-organ protection.

**Methods:** A retrospective electronic chart review was conducted for type 2 diabetic Veterans with HFrEF or CKD, prescribed empagliflozin between January 1, 2020 and January 1, 2021. Patients were included if they were 18 years of age or older and had been prescribed empagliflozin by a PVAMC provider. In addition, at least one blood pressure measurement must have been documented in the medical record pre and post empagliflozin initiation from an outpatient/ambulatory care visit (emergency department, inpatient, and/or hospital triage express care blood pressure readings were not assessed). Type 1 diabetics, kidney transplant patients and those receiving dialysis or hospice care were excluded. Veterans who required a visit to the intravenous (IV) diuretic clinic at any point during the study were also be excluded.

**Results:** The mean difference in systolic blood pressure from baseline will be compared 6-12 months after initiation of empagliflozin to characterize the effect on blood pressure control. The percent of patients achieving a blood pressure goal of <130/80 by the end of the 12-month follow-up period will also be reported. Results will be presented.

**Conclusions:** It is anticipated that this project will promote the use of empagliflozin for diabetes control, enhanced blood pressure management, and provide end-organ protection in Veterans
at the VA. Additionally, this study will explore two questions left unanswered by previous trials. The first is determining empagliflozin's impact on the dosing of other diuretics and second is evaluating the efficacy and safety of combination therapy with spironolactone and empagliflozin versus empagliflozin alone.
Primary Care Pharmacists' Impact on Vaccination Rates in the Geisinger Ambulatory Care Setting

Objectives: Despite significant advancements and initiatives within healthcare, many adults in the United States have not received the recommended vaccines. This study aimed to determine the impact that pharmacists in the primary care setting had on the number of patients vaccinated against influenza as they began to offer immunizations in the Geisinger outpatient clinics. Primary care pharmacists within Geisinger did not start vaccinating patients until September 2020. By utilizing the immunization efforts of the pharmacists, this will positively impact nurse workload and increase the number of vaccinated patients within the Geisinger outpatient setting.

Methods: This retrospective electronic medical review evaluated the primary impact on the number of vaccinated individuals in the clinics when primary care pharmacists began immunizing in the Geisinger outpatient clinics. The secondary outcomes were the change in nurse vaccination load and time relieved from nurses. Data collection included influenza vaccines administered to patients 18 years of age and older in the Geisinger outpatient clinics for the 2019 flu season (administered by nurses from September 2019 to May 2020) and 2020 flu season (administered by nurses and pharmacists from September 2020 to May 2021). Immunizations administered on the weekend and at a clinic that was not staffed five days per week by pharmacists were excluded.

Results: A comparison of the number of influenza vaccines administered by nurses in the 2019 flu season versus the number of influenza vaccines administered by both nurses and pharmacists in the 2020 flu season will be noted. The number of vaccines that all primary care pharmacists administered in the Geisinger outpatient clinic will be recorded to determine the impact on nurse vaccination load. The time relieved from nurses and overall change in the number of patients immunized in the clinics will be recorded. All results will be presented.

Conclusions: It is anticipated that the primary care pharmacists' influenza vaccination efforts will positively impact nurse vaccination workload and the number of vaccinated patients in the Geisinger outpatient setting.
Changes in ambulatory pharmacy practice in response to the covid-19 pandemic

Objectives: During the COVID-19 pandemic, public health concerns forced a shift in patient care strategies in order to continue to provide safe and effective care. For many health systems this meant shifting from in-person care to other methods. The primary objective of this study was to compare the total number of ambulatory pharmacist interventions in select clinics before vs during the COVID pandemic. The secondary objective was to compare the number of interventions by intervention type, by encounter type, and per clinic.

Methods: Patients that had an intervention documented by a pharmacist within the cardiology, gastroenterology, and family medicine clinics during April through September of 2019 or 2020 were included for retrospective review. A randomly generated group of ten percent of patients from each time period were included for analysis. Demographics, encounter method, and intervention type were abstracted. Data was collected using Redcap and analyzed using SPSS.

Results: A total of 213 interventions were recorded across 179 patient encounters. The number of pharmacist interventions increased from 97 in 2019 to 116 in 2020 (p = 0.035). Utilization of in-person methods decreased from 19 to 6 encounters (p =0.005) while pharmacist to provider encounters increased from 15 to 31 (p = 0.007), and telehealth methods were unchanged (55 vs 53, p = 0.691). Patients received more frequent refill assistance (16 vs 34 respectively, p = 0.003) and pharmacist to provider support (7 vs 17 respectively, p = 0.03). However, the number of medication reconciliations (8 vs 2 respectively, p = 0.049), and laboratory monitoring (19 vs 9 respectively, p = 0.03) decreased.

Conclusions: While in-person encounters decreased during the COVID-19 pandemic, use of telehealth encounters persisted and the use of pharmacy to provider encounters increased. Because of this, the overall number of pharmacist interventions increased, as did the number of refill assistance and pharmacist to provider interventions. Due to the reduced number of in-person encounters, the number of medication reconciliations and lab work initiated by pharmacy staff decreased accordingly. This shows that the Pennsylvania Hospital ambulatory pharmacy staff effectively adapted their practices through the continued use of telehealth and expanding their supporting roles in their various clinics.
Authors: Tayler Jackson, Patricia Ross, Caitlin Dowd-Green, Michael Streiff, Peggy Kraus, Martin Bishop

Title: Conversion of Eligible Vitamin K Antagonist Patients to Direct Oral Anticoagulants

Objectives: Direct oral anticoagulants (DOACs) were introduced to the US market in 2010 and provide multiple benefits over vitamin K antagonists (VKA, e.g. warfarin) therapy as they do not require frequent monitoring, fewer interactions (drug-drug, drug-food) and fixed dosing. Apixaban and rivaroxaban, specifically, have also been associated with fewer bleeding events. Due to the many benefits of DOACs, the 2016 CHEST guidelines recommended DOACs over VKA therapy for specific patients with VTE. However, the conversion of warfarin patients to treatment with DOAC is variable, including in the Johns Hopkins Health System. The purpose of this study is to convert eligible patients from a VKA to a DOAC through pharmacist screening, following CHEST guideline recommendations, and intervention via collaboration between an anticoagulation management service and the patient's primary care provider (PCP).

Methods: A retrospective chart review was conducted for adult patients actively managed at an outpatient hematology anticoagulation clinic in Baltimore, Maryland. A conversion algorithm developed in partnership with the clinic's hematologist medical director was created with specific inclusion criteria to determine if patients were eligible for conversion. Patients were excluded from the study if their time in therapeutic range (TTR) was < 65%, if they were diagnosed with a condition that contraindicated DOAC use or prescribed medications that significantly interacted with DOACs. Patients deemed eligible for conversion were then contacted via telephone to discuss benefits/risks of conversion. If patients agreed to conversion, their referring provider was then contacted to approve conversion. If patients denied conversion, the reason for denial was documented within the patients EMR. Descriptive statistics were used to summarize the data collected and to represent the primary and secondary outcomes.

Results: The two primary outcomes that will be presented are the number of patients successfully converted from VKA therapy to a DOAC and the number of patients converted to a specific DOAC (apixaban, rivaroxaban, edoxaban, and dabigatran). Secondary outcomes include: insurance of patients successfully converted, number of eligible patients who deny conversion, reason for conversion denial, and insurance of eligible patients who denied conversion.
Conclusions: It is anticipated that this project will provide the workflow needed to continuously assess if patients managed by a hematology clinic are eligible to convert to a DOAC.
Authors: Jiang C, Joshua W; Pennsylvania Hospital, Philadelphia, PA

Title: Improvements in A1C in Pharmacist-led Diabetes Management

Objectives: The objective of this study was to assess the improvements in A1C with physician plus pharmacist diabetes management compared to physician-only diabetes management.

Methods: This retrospective cohort study included 42 patients seen at the Pennsylvania Hospital Family Medicine clinic by a pharmacist plus physician and 43 patients seen only by a physician from January 1, 2020 to October 31, 2021. Inclusion criteria were those greater than eighteen years of age, diagnosed with type 2 diabetes (T2DM), have an A1C greater than seven at baseline, seen by a physician and/or pharmacist during the period when A1C was collected, had at least one patient-provider encounter, and had two A1C values obtained at least three months apart. Those managed by endocrinology were excluded. The primary outcome was the change in A1C. Secondary outcomes included the number of patients to achieve A1C less than seven percent, the change in LDL, the number of patients to achieve goal LDL levels, the cost savings, the number of patients indicated for statins per guidelines who were initiated on statins, and the number of patients indicated for an angiotensin-converting enzyme inhibitors/angiotensin receptor blockers (ACEI/ARB) per guidelines who were initiated on ACEI/ARB.

Results: The patients in the pharmacist cohort had the largest change in mean A1C with -1.49 compared to -0.925 in the physician cohort despite not being statistically significant (p=0.285). Subsequently, more patients in the pharmacist cohort saw an improvement in A1C [(30 of 42 (71.4%) vs 28 of 43 (65.1%)] despite the total number of patients who achieved an A1C <7% by the end was lower than the physician cohort [8 of 42 (19%) vs 11 of 43 (25.6%)]. However, the pharmacist cohort was managing patients with a higher baseline A1C (9.84 vs 8.9) and higher baseline LDL (99.6 vs 93.4). The pharmacist cohort observed a decrease in LDL whereas the physician cohort increased over time (-11.4 vs 0.4, P=0.189) with the following achieving an LDL <70 mg/dL [5 of 26 (19.2%) vs 10 of 32 (31.3%)]. No significant differences were identified with respect to statin and ACEI/ARB initiation. Any improvement in A1C will correlate with a reduction in expenditures. Cost saving differences were extrapolated for $5767 per hospital inpatient day, $1672 per hospital outpatient visit, $2067 per emergency visit, and $462 per physician office visit based on the percentage of patients with observed improvement in A1C.
**Conclusions:** Type 2 diabetes patients managed by a pharmacist plus physician did not result in a statistically significant change in mean A1C compared to patients managed by their physician only. However, data suggests that there may be a benefit observed beyond 22 months.
**Title:** Improvements in A1C in Pharmacist-led Diabetes Management

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**Conclusions:** Type 2 diabetes patients managed by a pharmacist plus physician did not result in a statistically significant change in mean A1C compared to patients managed by their physician only. However, data suggests that there may be a benefit observed beyond 22 months.
Objective of the study was to assess the improvements in A1C with physician plus pharmacist diabetes management compared to physician-only diabetes management.

Methods: This retrospective cohort study included 42 patients seen at the Pennsylvania Hospital Family Medicine clinic by a pharmacist plus physician and 43 patients seen only by a physician from January 1, 2020 to October 31, 2021. Inclusion criteria were those ≥18 years of age, diagnosed with type 2 diabetes, have an A1C >7% at baseline, seen by a physician and/or pharmacist during the period when A1C was collected, had at least one patient-provider encounter, and had two A1C values obtained at least three months apart. Those managed by endocrinology were excluded. The primary outcome was the mean difference in A1C. Secondary outcomes included the percentage of patients to achieve A1C <7%, the mean difference in LDL, the percentage of patients to achieve goal LDL levels, the cost savings, the percentage of patients indicated for statins per guidelines who were initiated on statins, and the percentage of patients indicated for an angiotensin-converting enzyme inhibitors/angiotensin receptor blockers (ACEI/ARB) per guidelines who were initiated on ACEI/ARB.

Results: The patients in the pharmacist cohort had the largest mean difference in A1C with -1.49 compared to -0.925 in the physician cohort despite not being statistically significant (p=0.285). Subsequently, more patients in the pharmacist cohort saw an improvement in A1C [(30 of 42 (71.4%) vs 28 of 43 (65.1%)] despite the total number of patients who achieved an A1C <7% by the end was lower than the physician cohort [8 of 42 (19%) vs 11 of 43 (25.6%)]. However, the pharmacist cohort was managing patients with a higher baseline A1C (9.84 vs 8.9) and higher baseline LDL (99.6 vs 93.4). The pharmacist cohort observed a decrease in LDL whereas the physician cohort increased over time (-11.4 vs 0.4, P=0.189) with the following achieving an LDL <100 mg/dL [13 of 36 (36.1%) vs 14 of 41 (34.1%)]. No significant differences were identified with respect to statin and ACEI/ARB initiation. Cost saving differences were extrapolated for $5767 per hospital inpatient day, $1672 per hospital outpatient visit, $2067 per emergency visit, and $462 per physician office visit based on the percentage of patients with observed improvement in A1C.

Conclusions: Type 2 diabetes patients managed by a pharmacist plus physician did not result in a statistically significant mean difference in A1C compared to patients managed by their
physician only. However, the percent difference in A1C was comparable to similar previous clinical studies. The results from this study further contributes to the library of literature demonstrating that adding a pharmacist to the diabetes management team may effectively lower A1C in patients with more advanced and uncontrolled type 2 diabetes.
Impact of an embedded clinical pharmacist on a cannabidiol monitoring program

Objectives: Cannabidiol is FDA-approved for treatment of seizures associated with Lennox-Gastaut Syndrome, Dravet Syndrome, and Tuberous Sclerosis Complex. Because of the risk of liver injury observed in clinical trials, manufacturer prescribing information for cannabidiol recommends serial monitoring of serum aspartate aminotransferase (AST), alanine aminotransferase (ALT) and bilirubin levels at baseline and at one month, three months, and six months of therapy. A specialty clinical pharmacist embedded in the multidisciplinary clinical team assists Maine Medical Partners (MMP) Neurology providers by regularly following up with patients to track these lab values and provide recommendations for medication adjustments, as appropriate.

Methods: This retrospective chart review evaluated clinical pharmacist involvement in adherence to manufacturer-recommended laboratory monitoring for patients undergoing treatment of a seizure disorder with cannabidiol. Patients were included if they received a prescription for cannabidiol from an MMP Neurology provider and had at least one fill of cannabidiol via the Specialty Pharmacy at Maine Medical Center between January 1, 2019 and December 31, 2020. The primary outcome was overall adherence to laboratory monitoring at baseline and one month, three months, and six months after starting cannabidiol. Secondary outcomes included rate and type of pharmacist intervention, use of concomitant antiepileptic drugs, and rates of AST, ALT, or bilirubin elevation.

Results: One hundred three patients were included in the study. The median number of concomitant antiepileptic drugs per patient was 3.0 (range 0-7), most commonly clobazam (44.7%), any form of valproic acid (39.8%), and lamotrigine (34.0%). Adherence to recommended laboratory monitoring was 98.1% at baseline, 69.1% at one month, 60.7% at three months, and 67.5% at six months. A clinical pharmacist conducted 187 unique interventions, with 80.6% of patients receiving at least one intervention. Reminders for laboratory monitoring comprised 84.4% of all interventions conducted by the clinical pharmacist. Of patients that received a reminder for laboratory monitoring, 79.8% went on to have laboratory monitoring conducted. One patient had an elevation in AST above three times the upper limit of
normal at three months; no other significant elevations in AST, ALT, or bilirubin were observed throughout the study.

**Conclusions:** This study demonstrated the potential benefit of clinical pharmacist integration into a multidisciplinary specialty clinic team with high adherence rates to manufacturer-recommended laboratory monitoring and no adverse safety outcomes in patients taking cannabidiol.
Implementation of a pharmacist-led outpatient transitions of care program

**Objective:**
Patients without effective transitions of care (TOC) are at an increased risk for hospital readmission, resulting in poor patient outcomes and substantial healthcare costs. Several complications can occur during the TOC process including miscommunication between providers, incomplete medication reconciliation, and lack of patient involvement and education. Several studies describe pharmacist-led TOC programs in the acute care setting, but they focus primarily on providing medication reconciliation upon hospital discharge, which is not enough to prevent unfavorable clinical outcomes post-discharge. This study describes the implementation of a pharmacist-led TOC program in an outpatient clinic and evaluates its impact in reducing medication errors and optimizing patients' treatment plans.

**Methods:** A retrospective, descriptive study was performed to assess interventions made by the pharmacy team during outpatient TOC appointments. Patients included in the study were 18 years or older, active clinic patients, and were discharged from the hospital from October 1, 2021 to March 30, 2022. For inclusion, patients must have been hospitalized for complex diagnoses such as diabetes, heart failure, acute coronary syndromes, or pulmonary disorders, including acute COPD exacerbation. Patients were also required to be on a minimum of 10 scheduled medications at discharge. Patients were excluded from this study if they chose not to participate in the pharmacist-led TOC clinic or did not attend their physician follow-up appointment. Patient data that was collected includes: age, sex, primary care provider (PCP), length of hospital stay, admitting diagnosis, and number of discharge medications. The primary outcome of this study is the number of interventions made by the pharmacy team per patient during TOC visits. Secondary outcomes include the types of interventions made (omission, addition, optimization, etc) and the provider acceptance rate for recommendations made by the pharmacy team.

**Results:** The number of interventions made and percentage of recommendations accepted will be recorded, and the results will be presented.

**Conclusions:** It is anticipated that this project will demonstrate a role for pharmacist-led TOC programs in the outpatient setting in order to reduce medication errors, improve interprofessional collaboration, and encourage patient engagement.
Presenter Name: Kunche, Neha  
Organization: Lebanon Veterans Affairs Medical Center  
Category: Ambulatory Care  
Day | Session | Room | Time: Tuesday | 4 | Crystal A | 2:45:00 PM

Authors: N. Kunche; A. Prasad; M. Margut; M. Bowen  
Title: Evaluating the implementation of pharmacist-led chronic obstructive pulmonary disease management service  
Objectives: Chronic Obstructive Pulmonary Disease (COPD) is a common chronic disease state that affects about 25% of the Veteran population. When comparing the Lebanon Veteran Affairs Medical Center’s (LVAMC) metrics to the national average, the use of inhaled corticosteroid (ICS) without long-acting muscarinic antagonists/long-acting beta-agonists (LAMA/LABA) and ICS de-escalation candidates were higher than the national average. Since most COPD management involves medication treatment, implementing a pharmacist-led COPD management service could help improve these outcomes.

Methods: Patient candidates for de-escalation and baseline data for this quality improvement project were collected through the LVAMC COPD metrics dashboard. Once deemed an appropriate candidate through further chart review and informing Patient Aligned Care Team (PACT) providers, patients were scheduled with clinical pharmacy specialists for COPD management. The impact of pharmacist involvement was assessed with respect to the primary outcomes which are ICS without LAMA/LABA and de-escalation of ICS and secondary outcomes which are the 30-day readmission rates and adherence and inhaler technique.

Results: The number and type of pharmacists’ interventions based on the outcomes will be reviewed, documented, and presented to determine the overall impact.

Conclusions: It is anticipated that this project overall has demonstrated a benefit from pharmacy led-COPD service with education on adherence, inhaler administration, and vaccine recommendations but not necessarily a wide impact on the specific ICS de-escalation, ICS without LAMA/LABA and 30-day readmission rate outcomes as expected.
Conference Abstracts
May 16-18, 2022

Presenter Name: Lazar, Kalyn
Organization: VA Boston Healthcare System, Boston, MA
Category: Ambulatory Care
Day | Session | Room | Time: Wednesday | 6 | Crystal A | 3:45:00 PM

Authors: Kalyn Lazar, Andrew Krevat, Bryan Wood

Title: Tolerability of a sodium-glucose cotransporter-2 inhibitor for type 2 diabetes mellitus or heart failure in VA Boston Healthcare System patients

Objectives: Sodium-glucose cotransporter-2 (SGLT2) inhibitors are oral medicines developed to lower blood glucose in type II diabetes (T2DM). SGLT2 inhibitors have also been shown to reduce the risk of cardiovascular events and hospitalizations from heart failure (HF). Because of these other benefits, SGLT2 inhibitors now have a Federal Drug Administration (FDA) labeled indication for patients with HF regardless of the presence or absence of T2DM. The VA Boston Criteria for Use is in line with this FDA label and current clinical guidelines. Therefore, patients with HF are eligible to receive the formulary SGLT2 inhibitor, empagliflozin, even if they do not have T2DM. Genitourinary adverse effects related to glycosuric action have been reported with SGLT2 inhibitors. Limited evidence exists on indication-specific incidence of adverse effects, since HF trials report these rates for the whole study population, which include patients with comorbid T2DM. Further understanding is needed to determine whether VA Boston patients with HF and no T2DM are at the same risk for these adverse events from SGLT2 inhibitors as patients with T2DM.

Methods: This retrospective analysis plans to examine a maximum of 100 patients with HF and no T2DM and 100 patients with T2DM and no HF. Patients will be included who were started on empagliflozin for either T2DM or HF between 1/1/2020 and 12/31/2020, are age 18 and older, and are enrolled with primary care at VA Boston Healthcare System. Patients will be excluded if they have both T2DM and HF, have poor medication adherence defined by empagliflozin proportion of days covered <50% over the study period, or have documented history of genitourinary tract infections, ketoacidosis, or catheter use at baseline. HF and T2DM cohorts will be age-matched.

Results: The primary outcome of medication persistence, defined as the percent of patients that have an active empagliflozin prescription 1 year after initiation, stratified by T2DM or HF indication, will be reported. The secondary outcome will explore reasons for SGLT2 inhibitor discontinuation, also stratified by T2DM or HF indication.

Conclusions: Results of this analysis will be shared with VA Boston clinicians in cardiology clinics to provide insight on indication-specific adverse effect profiles of empagliflozin. It is anticipated that these results will assist VA Boston clinicians in making better informed
decisions when prescribing this medication. Based on anticipated results, changes to our local Criteria for Use may be considered to promote safe and effective use of empagliflozin based on the disease state indication.
**Title:** Optimal timing of filgrastim initiation after autologous hematopoietic cell transplantation

**Objectives:** One of the major causes of morbidity and mortality in autologous hematopoietic stem cell transplantation (aHSCT) is infection resulting from prolonged neutropenia. Filgrastim (G-CSF) is one of the most common colony stimulating factors used to expedite neutrophil recovery. However, there is currently no consensus on the optimal time to initiate filgrastim following aHSCT. Several studies have evaluated the impact of filgrastim on the time to neutrophil engraftment using an early initiation strategy versus a late initiation strategy. However, one of the primary limitations of these studies has been small sample size. The objective of this study is to determine the difference in time to neutrophil engraftment in patients with multiple myeloma or lymphoma who received filgrastim on day +1 compared to those who received it on day +5 post aHSCT at Montefiore Medical Center.

**Methods:** This study is a single-center, retrospective chart review of patients who were diagnosed with multiple myeloma or lymphoma and who received an aHSCT followed by filgrastim post-transplant administered on either day +1 or day +5. As the day for initiation of filgrastim changed in January of 2007 from day +1 to day +5, the first cohort of patients (early strategy) will be those who received an aHSCT followed by day +1 filgrastim from January 2003 through December 2006. The second cohort of patients (late strategy) will be those who received an aHSCT followed by day +5 filgrastim from January of 2007 through December of 2011.

**Results:** Results regarding time to neutrophil engraftment, time to platelet engraftment, and Length of hospitalization post-transplant will be presented.

**Conclusions:** As the need of aHSCT in patients with multiple myeloma or lymphoma (HD/NHL) rises in the United States, this study will offer more defined guidance on the optimal timing of G-CSF initiation following aHSCT. By optimizing our dosing strategy throughout our medical center, we will improve the care our patients receive, which in turn, will lead to better patient experience and outcomes. If our study finds that a delay in the initiation of filgrastim (day +5) has no clinically significant difference when compared to early initiation (day +1), it will reduce the number of injections, reducing pharmacy and nursing workloads and the costs associated with the drug therapy and overall hospitalization. However, if our study finds that a delay in the
initiation of filgrastim results in increased risk of infection or longer hospitalization, we will need to optimize our current dosing strategy which may change the workload of pharmacy and nursing departments.
Assessment of Home Medication Use at a Refugee Clinic

Presenter Name: Macko, Samantha
Organization: Thomas Jefferson University Hospital
Category: Ambulatory Care
Day | Session | Room | Time: Tuesday | 3 | Crystal A | 1:00:00 PM

Authors: Samantha Macko, PharmD, BS, Shirley Bonanni, PharmD, BCPS, Yingzhi Zhang, PharmD, BCPS, Marc Althshuler, MD, Jessica Deffler, MD

Title: Assessment of Home Medication Use at a Refugee Clinic

Objectives: In the United States, approximately 50% of all prescription medications are taken incorrectly, in regards to frequency, dosage and duration. Refugees are especially vulnerable to many health-related issues, and immigrants often face communication barriers, making them more susceptible to harmful medication-related problems. Refugee and immigrant patients may have medications in their household that are expired, duplicate therapies, prescribed to someone else in household, or not refilled properly. A medication review involves extensive examination of a patient's medications to minimize potentially harmful medication-related problems while maximizing treatment benefits. The primary objective of this study was to describe the medications found in the households of patients at a refugee and immigrant wellness center by a thorough medication review performed by a pharmacist. Secondary objectives were to evaluate the medication-related problems identified by a pharmacist during the medication review and the subsequent interventions made.

Methods: A retrospective chart review was conducted of patients who were provided a numbered medication bag at a clinic visit from September 2021 to March 2022. Patients were included in the study if they were at least 18 years old, a patient at the clinic, and taking at least one scheduled medication. Patients planning to relocate out of the Philadelphia area within six months or declining pharmacy services were excluded. A thorough medication review was performed for all medications found in a patient's household - i.e., prescription, over-the-counter, and supplements. The pharmacist then identified and addressed medication-related problems and provided patient education when appropriate. All interventions were documented in the electronic medical record.

Results: The percentage of patients with medication-related problems and the frequency of each intervention type made by the pharmacist will be presented at the Eastern States Conference.

Conclusions: Study findings are anticipated to demonstrate a key role for pharmacists in the ambulatory care setting, especially regarding the safety and efficacy of medication use. Positive results are expected to make medication bag reviews a standard of care at the wellness center.
Impact of targeted medication reviews that assess clinical appropriateness of sodium-glucose cotransporter-2 inhibitors and/or glucagon-like peptide-1 receptor agonists in patients with compelling indications

**Objectives:** Targeted medications reviews (TMRs) are utilized across the primary care clinics at Cambridge Health Alliance (CHA) to optimize management of diabetes and improve population health outcomes. The purpose of this quality improvement project is to evaluate the clinical impact of completed TMRs and assess the effectiveness of completing a TMR.

**Methods:** Adult patients, ages 18 years or older, with type 2 diabetes were included if they had at least one or more of the following: chronic kidney disease, heart failure, an atherosclerotic cardiovascular disease (ASCVD) event, and/or ASCVD risk factors. The primary outcome was the percentage of patients with a completed TMR initiated on evidence-based medicine (EBM). Secondary outcomes were improvement in hemoglobin A1c and the number of patients who have a diabetes medication with a high risk of hypoglycemia (e.g., sulfonylureas and insulin) discontinued.

**Results:** A total of 205 TMRs for 204 patients across CHA's twelve primary care clinics were completed from January 2021 to March 2022. Preliminary data shows that 104 patients were initiated on a sodium-glucose cotransporter-2 inhibitors (SGLT2i) and/or glucagon-like peptide-1 receptor agonists (GLP-1RA). Final results will be presented.

**Conclusions:** It is anticipated that this quality improvement project will show the impact of targeted reviews on the improvement of A1c goals and overall better patient outcomes at CHA.
Comparison of Effectiveness and Safety Outcomes in Patients with Dose Escalation of Empagliflozin in Practice

**Objectives:** For patients newly diagnosed with Type 2 diabetes, metformin remains the drug of choice. However, second line treatment options include the novel class of sodium-glucose co-transporter 2 (SGLT2) inhibitors. Although both doses of the SGLT2, empagliflozin, have been found to be effective, safe, and provide additional cardio protection, there is a lack of research assessing the benefit or risk of dose escalation. The purpose of this study is to assess the real-world effectiveness and safety outcomes of patients undergoing dose escalation of empagliflozin 10mg to 25mg daily.

**Methods:** This was a retrospective, single center cohort study using electronic health record data from May 2015 to May 2021. Patients included were ages 18 years and older with a diagnosis of Type 2 diabetes who had been prescribed empagliflozin 10mg daily with or without additional diabetes medications for at least 3 months. Patients were excluded if they had been prescribed another SGLT2 during the study period or if there was incomplete data. The two study arms included the intervention group of patients who received a dose escalation to empagliflozin 25mg after at least 3 months on empagliflozin 10mg, and the comparison group of patients who continued the 10mg dose. Primary outcomes studied were the proportion of patients with a change in A1c greater than or equal to 0.5% 10-26 weeks after the index date and the proportion of patients with a composite of two or more urinary tract infections and genital yeast infections in the six months after the index date. Secondary outcomes included the average change in A1c and body weight 10-26 weeks after the index date, as well as the average number of urinary tract infections and genital yeast infections in the six months after the index date.

**Results:** A total of 2912 patients' data were included in the study. Due to timing of laboratory monitoring and vitals, 572 patients were analyzed for A1c change, 1006 patients for weight change, and 2912 patients for infection rate. The primary outcome showed that dose escalation resulted in a change in A1c greater than or equal to 0.5% in 156 out of 442 (35.3%) compared to 36 out of 130 (27.7%) for those who continued the lower dose (p = 0.107). The number of patients with composite outcomes of 2 or more urinary tract and genital yeast infections was
found to be 11 out of 1232 (0.89%) for those receiving dose escalation and 20 out of 1680 (1.19%) for those who did not (p = 0.439).

**Conclusions:** This study showed no difference in effectiveness or safety outcomes in patients who were maintained on empagliflozin 10mg daily versus those who were escalated to 25mg daily.
Authors: McKenna McClure, PharmD; Carol Botelho, PharmD, BCACP, BCGP

Title: Impact of the implementation of VIONE, a medication deprescribing tool, in Veterans enrolled in home-based primary care within a Veterans Affairs healthcare system

Objectives: Polypharmacy is most commonly defined as the simultaneous use of five or more medications. The prevalence in patients aged 65 years or older is estimated to be approximately 30%. Patients with polypharmacy are at increased risk of adverse outcomes. VIONE is a medication deprescribing tool used within the VA to reduce polypharmacy and improve patient outcomes. The purpose of this study is to implement VIONE within home-based primary care (HBPC) and compare the effectiveness of the tool in deprescribing medications as compared to the current standard of care, quarterly chart reviews by HBPC clinical pharmacist practitioners.

Methods: This is a non-randomized quality improvement project to assess the impact of implementation of VIONE in the HBPC setting. Eligible patients will be identified through the VIONE patient data dashboard on the Veterans Affairs Academic Detailing SharePoint. Patients will be included if they have been enrolled in HBPC for a minimum of three months and have a VIONE risk score of three or higher. Patients on hospice or palliative care will be excluded. Patients will be contacted via phone to conduct a VIONE appointment. Priority will be given to patients with a VIONE risk score of four or five. The primary endpoint will assess the average number of medications that are discontinued per patient using the VIONE tool. Secondary endpoints will analyze the reasons for medication discontinuation, the pharmacologic classes of medications that are discontinued, and missed opportunities on HBPC clinical pharmacist practitioner quarterly reviews.

Results: The average number of medications that are discontinued through VIONE will be recorded and results will be presented.

Conclusions: It is anticipated that this project will demonstrate areas where deprescribing can be utilized. This project will also identify missed opportunities in HBPC clinical pharmacist quarterly reviews.
Evaluation of pharmacist-led lipid-lowering interventions for secondary ASCVD prevention in HIV-positive patients

**Objectives:** HIV-infected patients have an increased risk of cardiovascular events. Several observational cohort studies have demonstrated increased rates of myocardial infarction or coronary heart disease in HIV-positive patients, with an approximate 1.5-2-fold increased relative risk. According to the 2020 American Heart Association/American Association of Clinical Endocrinologists Guidelines, all patients with clinical atherosclerotic cardiovascular disease (ASCVD) should be initiated on a high-intensity or maximally tolerated statin. Additional therapy may be indicated based on low-density lipoprotein cholesterol (LDL-C) levels and goal LDL-C, which is determined based on patient-specific risk stratification. The objective of this study is to assess the impact of pharmacist intervention among HIV-positive patients indicated to receive lipid-lowering therapies for secondary ASCVD prevention.

**Methods:** This is an institutional review board approved, prospective quality improvement study utilizing electronic medical records of patients seen in the HIV primary care clinic at The Brooklyn Hospital Center from July 2020-July 2021. Patients were identified and reviewed based on documentation of ICD-10 codes for both HIV and ASCVD and were assessed for candidacy of additional lipid-lowering therapy according to LDL-C goals of <55 mg/dl or <70 mg/dl (based on patient-specific risk stratification). The primary outcome is the percentage of patients optimized to goal LDL-C at least 6 weeks after pharmacist intervention.

**Results:** Results will be presented.

**Conclusions:** It is anticipated that this project will demonstrate the impact of pharmacist intervention on reaching LDL-C goals in patients with HIV and ASCVD.
Pharmacist Impact on Improving A1C and Hypertension in an Ambulatory Care Setting

Baystate High Street Health Center and Brightwood Health Center Adult Medicine has pharmacist-run ambulatory hypertension and pharmacotherapy clinics. The clinic cares for approximately 13,000 patients. Pharmacists in this setting collaborate with other medical providers and offer pharmacologic and non-pharmacologic recommendations to improve patient care. Pharmacists maintain a unique and accessible position for patient care. However, the role of pharmacists in these ambulatory care settings on patient care is not well defined and medications for these patients are typically managed by the patient's primary care provider or related specialist. Baystate Medical Center is a part of various accountable care organizations (ACOs), which are composed of doctors, hospitals, and other health care providers who voluntarily come together to give coordinated care to their patients. This high-quality care helps ensure that patients, especially those with chronic conditions, receive appropriate and timely care while avoiding duplication of services and preventing medical errors. The hypertension and hemoglobin A1C goals described in this trial are based on the Health New England ACO metrics.

Methods: This quality improvement project will take place at Baystate Medical Center in Springfield, MA from 10/2021 to 5/2022. The patient population will consist of adult patients at Brightwood and High Street Health Center with a most recent hemoglobin A1C >9% and blood pressure >140/90. Eligible patients will be scheduled for an office visit at the Brightwood or High Street Health Center. Follow up will occur every 2-4 weeks and A1C will be repeated at 3 months. Additionally, chart reviews will be performed to indicate if the patient is a candidate for a medium or high intensity statin based on individual patient factors and current ADA guidelines. The number of patients who transfer their prescriptions from an outside pharmacy to Brightwood or High Street Pharmacy will be recorded. Outcomes will include the conversion rates for the percentage of patients who have a blood pressure <140/90 and A1C <9% by the end of the project, as well as the conversion rates for patients who are eligible for medium or high-intensity statin therapy who initiate statin therapy by the end of the project and percentage of patients who convert from an external pharmacy to Brightwood or High Street Pharmacy.

Results: Preliminary results will be included in the presentation.
**Conclusions:** It is anticipated that the results of this project will allow for the assessment of the impact of pharmacist intervention in relation to hypertension and diabetes management. This data may demonstrate the effects that pharmacists have in an ambulatory care setting and may indicate a need for expansion of pharmacist services within Baystate Medical Center.
**Objective:** Prostate cancer is one of the most prevalent types of male cancer world-wide. Pharmacologic treatment strategies include androgen deprivation therapy (ADT) with medications that inhibit androgen signaling, receptor activity, or synthesis. However, ADT may increase the risk of adverse cardiovascular events including myocardial infarction, stroke, and cardiovascular death. Compared to gonadotropin releasing hormone agonists and antagonists, abiraterone and enzalutamide have been demonstrated to have higher risk of cardiovascular disease. Mechanisms of increased cardiovascular risk with ADT include promotion of atherosclerotic lesion formation, increased adiposity, and insulin resistance. Statins, in addition to cardiovascular risk reduction, may have an additional benefit of delaying prostate cancer progression and therefore may be safe and effective medications in patients with prostate cancer receiving medications associated with high cardiovascular risk with or without a pre-existing indication for statins. The purpose of this study is to evaluate the effect of statins on cardiovascular and oncologic outcomes in patients with prostate cancer receiving abiraterone or enzalutamide.

**Methods:** A retrospective chart review will be conducted of the computerized patient record system (CPRS) to assess objectives among adult male Veterans who received an outpatient prescription for abiraterone or enzalutamide for the treatment of prostate cancer between January 1, 2017 through January 30, 2021. Patients will be considered to have concomitant statin use if a prescription for a statin was active at the time of abiraterone or enzalutamide initiation, or initiated within three months after. Follow-up will be censored at initiation of a statin in patients with a statin initiated greater than three months after ADT initiation. Data collected from CPRS will include demographics, medical history, baseline labs, statin and ADT medications used, cardiovascular events, cancer metastasis, and prostate-specific antigen (PSA) doubling time. The primary objective is to evaluate the effect of statin prescription on cardiovascular events among patients with prostate cancer receiving abiraterone or enzalutamide. The secondary objective is to evaluate the effect of statin prescription on oncologic outcomes of PSA doubling time and progression to metastatic disease.
**Results:** Results are currently pending completion of data collection. Following completion of data collection, results will be presented regarding cardiovascular and oncologic outcomes in patients receiving ADT with and without concomitant statin use.

**Conclusions:** Conclusions are currently pending completion of data collection.
Objectives: Inhaled corticosteroids (ICS) are associated with increased risk of adverse effects including pneumonia, and a medication use evaluation recently conducted at Veterans Affairs (VA) Hudson Valley Health Care System suggested that they are overprescribed in patients with chronic obstructive pulmonary disease (COPD). The VA Pharmacy Benefits Management (PBM) has published guidance for de-escalation of ICS in patients with COPD. This project was developed to educate primary care providers about ICS de-escalation, use the VA PBM published guidance to successfully de-escalate patients, and improve adherence to evidence-based pharmacotherapy and monitoring requirements for patients with COPD.

Methods: The VA PBM Academic Detailing COPD ICS De-escalation Dashboard was used to identify the top 20 prescribers of ICS to patients potentially eligible for de-escalation. The pharmacist then reached out to prescribers individually to set up academic detailing visits. During these virtual video visits, providers were asked about experience in prescribing and de-prescribing ICS, education was provided on the purpose and use of VA PBM ICS De-escalation guidelines, and potentially eligible patients were identified. Individual provider barriers to compliance were recorded and addressed. Providers were also given the option to refer all identified patients to the Pharmacy COPD clinic for evaluation and de-escalation, if appropriate. Data collected for patients evaluated within the pharmacy clinic included standardized symptom assessment scores, last pulmonary function test (PFT) results, smoking status, current inhaler prescriptions, and inhaler adherence and technique. Patients were evaluated for appropriateness of de-escalation, and any barriers were noted.

Results: The number of patients appearing on the ICS De-escalation Dashboard at the end of this study will be compared to data from 2021-2022 fiscal year quarter 1. Additional reported results will include change in number of Pharmacy COPD clinic referrals, provider barriers to compliance, patient barriers to de-escalation, and number of patients overdue for PFT’s, without a rescue inhaler, without first-line LAMA therapy, and with an incorrect pulmonary diagnosis.
**Conclusions:** It is anticipated that this project will reinforce the role of pharmacist-based assessment and management of COPD in primary care to promote compliance with current evidence-based treatment guidelines and improve patient outcomes.
Author: Abegale Nelson, PharmD and Rita Bodine, PharmD

Title: Promotion of inhaled corticosteroid de-escalation and COPD treatment optimization through academic detailing, population health management, and utilization of a pharmacist-run COPD clinic

Objectives: Inhaled corticosteroids (ICS) are associated with increased risk of adverse effects including pneumonia, and a medication use evaluation recently conducted at Veterans Affairs (VA) Hudson Valley Health Care System suggested that they are overprescribed in patients with chronic obstructive pulmonary disease (COPD). The VA Pharmacy Benefits Management (PBM) has published guidance for de-escalation of ICS in patients with COPD. This project was developed to educate primary care providers about ICS de-escalation, use the VA PBM published guidance to successfully de-escalate patients, and improve adherence to evidence-based pharmacotherapy and monitoring requirements for patients with COPD.

Methods: The VA PBM Academic Detailing COPD ICS De-escalation Dashboard was used to identify the top 20 prescribers of ICS to patients potentially eligible for de-escalation. The pharmacist then reached out to prescribers individually to set up academic detailing visits. During these virtual video visits, providers were asked about experience in prescribing and de-prescribing ICS, education was provided on the purpose and use of VA PBM ICS De-escalation guidelines, and potentially eligible patients were identified. Individual provider barriers to compliance were recorded and addressed. Providers were also given the option to refer all identified patients to the Pharmacy COPD clinic for evaluation and de-escalation, if appropriate. Data collected for patients evaluated within the pharmacy clinic included standardized symptom assessment scores, last pulmonary function test (PFT) results, smoking status, current inhaler prescriptions, and inhaler adherence and technique. Patients were evaluated for appropriateness of de-escalation, and any barriers were noted.

Results: The number of patients appearing on the ICS De-escalation Dashboard at the end of this study will be compared to data from 2021-2022 fiscal year quarter 1. Additional reported results will include change in number of Pharmacy COPD clinic referrals, provider barriers to compliance, patient barriers to de-escalation, and number of patients overdue for PFT's, without a rescue inhaler, without first-line LAMA therapy, and with an incorrect pulmonary diagnosis.
**Conclusions:** It is anticipated that this project will reinforce the role of pharmacist-based assessment and management of COPD in primary care to promote compliance with current evidence-based treatment guidelines and improve patient outcomes.
Authors: Precious Ohagwu, Rachael Luconte, Erin Slazak, Samantha Will

Title: Outcomes of Medication Therapy Management (MTM) Interventions by pharmacists embedded in a primary care practice

Objectives: Medication Therapy Management (MTM) is performed by pharmacists in multiple practice settings including community pharmacies and primary care clinics. MTM interventions aim to streamline medication regimens, reduce risk of side effects, improve medication adherence, and reduce unnecessary drug therapy. This study analyzes the MTM interventions by pharmacists embedded within a primary care clinic.

Methods: A retrospective chart review of pharmacy MTM interventions completed in Outcomes MTM® was performed. All MTMs conducted by pharmacists at General Physician, PC (GPPC) between June 2021-December 2021 were included. Reports from Outcomes MTM® were reviewed to determine number and types of interventions and cost-avoidance data. Electronic health records were reviewed to determine provider acceptance of the interventions. Data will be presented using descriptive statistics including mean and standard deviation (SD), median and interquartile range (IQR), and number and percentage.

Results: The results of this study will describe the number and type of interventions provided by GPPC pharmacists including action, result, and provider acceptance rate. In addition, an economic analysis will be performed of the MTM services provided at GPPC, including a return on investment (ROI) of the service and calculation of cost-avoidance based on interventions made.

Conclusions: Results from this study will highlight the impact of pharmacists embedded in a primary care practice in improving patient outcomes. Further study comparing the difference in outcomes between embedded clinical pharmacists and community pharmacists provide more insight into the most effective setup for delivery of MTM.
Conference Abstracts
May 16-18, 2022

Presenter Name: Pastino, Alissa
Organization: Veterans Affairs Medical Center (VAMC), Lebanon, Pennsylvania
Category: Ambulatory Care
Day | Session | Room | Time: Wednesday | 6 | Crystal A | 4:00:00 PM

Authors: A. Pastino, M. Bowen, H. Ulrich

Title: Impact of adding glucagon-like peptide-1 receptor agonist to basal-bolus insulin regimen

Objectives: The goal of this project is to evaluate the impact that glucagon-like peptide-1 receptor agonists (GLPs) have on efficacy and quality of life in Veterans previously on a basal-bolus insulin regimen. Based on the findings, it can be determined whether more Veterans should be transitioned from an intensive insulin regimen to GLP, or whether patients should be placed directly on a GLP rather than bolus insulin, in order to improve outcomes.

Methods: This project includes a patient satisfaction survey and retrospective chart review of Lebanon VAMC patients previously on basal-bolus insulin regimens who have trialed a GLP. Patient demographics, insulin regimen, weight, and hemoglobin A1c are being compared before and after the addition of a GLP at 3, 6, and 12 months. Exclusion criteria are patients taking sodium-glucose cotransporter-2 inhibitors at baseline or during evaluation period, patients taking weight loss medications (phentermine, phentermine-topiramate, bupropion-naltrexone, orlistat) during evaluation period, and patients who started the GLP less than one year ago or under the care of a non-VA provider.

Results: The following will be recorded and presented: percentage of patients meeting hemoglobin A1c target by 6 months, percent changes in body weight and A1c at 3, 6, and 12 months, number of patients who completely transitioned off of insulin, percent reduction in insulin doses, number of patients who failed GLP therapy, and patient satisfaction regarding quality of life and incidences of hypoglycemia.

Conclusions: It is anticipated that this project will demonstrate that the majority of patients who continued the GLP will meet A1c target at 6 months, as well as have an improvement in quality of life due to decreased insulin use, less frequent injections, less incidences of hypoglycemia, and weight loss. It is expected that these results will support increased use of GLPs in Lebanon VAMC patients with diabetes.
Impact of pharmacist-driven workflow in implementing ACO insulin formulary changes at a federally qualified health center

**Authors:** Hemali Patel, Alicia Mam DaCunha, Ashley Rogers, and Ashwini Ranade

**Title:** Impact of pharmacist-driven workflow in implementing ACO insulin formulary changes at a federally qualified health center

**Objectives:** In order to help primary care providers switch patients to the preferred insulin brand on the insurance formulary, the clinical pharmacy team created, led, and implemented a pharmacist-driven workflow to minimize gaps in therapy, which ultimately would improve medication adherence. The patient education provided can minimize medication adverse events and, overall, improve physician satisfaction. The primary objective of this project is to evaluate primary care provider (PCP) satisfaction with pharmacist-managed ACO insulin formulary changes.

**Methods:** A survey was administered to primary care providers of patients who were affected by the ACO insulin formulary change. Survey data assessed primary care provider satisfaction with the pharmacist-driven workflow using questions regarding communication, medication management, workflow, team care, and overall thoughts. Descriptive statistics were computed for the variables of interest using SAS 9.4 version.

**Results:** Of the 81 primary care providers impacted by the formulary change, 32 (39.5%) providers completed the survey. In terms of communication, 75% of providers strongly agreed that messages within the Electronic Health Record (EHR) recommending an alternative insulin by the clinical pharmacist were helpful compared to providers independently reviewing different options available on the new insurance formulary. In regards to medication management, 65.63% of providers strongly agreed and 31.25% of providers agreed that clinical pharmacist assistance with co-management of diabetes was helpful. When looking at workflow, 65.63% of providers strongly agreed and 25% of providers agreed that clinical pharmacists made switching to an ACO preferred insulin therapy easier by identifying patients, coordinating the transition from one insulin to another, and educating patients, pharmacies, and providers involved. In terms of team care, 96.88% of providers strongly agreed that clinical pharmacists are valuable members of the primary care team. Overall, 75% of providers strongly agreed that they were satisfied with the care provided by clinical pharmacists during the ACO insulin formulary change.

**Conclusions:** The study demonstrated primary care provider satisfaction with pharmacist-managed ACO insulin formulary changes. A formal workflow process to facilitate medication
formulary changes may be beneficial at other health systems to improve continuity of care and provider satisfaction.
Impact of incorporating an ambulatory care pharmacist in the rheumatology setting to coordinate medication access

**Authors:** Karishma Patel, PharmD; Andrea Winston, PharmD, BCACP; Amanda Williams, PharmD, BCACP, CDCES

**Title:** Impact of incorporating an ambulatory care pharmacist in the rheumatology setting to coordinate medication access

**Objectives:** Rheumatology is a clinical practice area consisting of costly specialty medications, which can lead to barriers in ensuring that these medications are covered by insurance and accessible to patients. Pharmacists are experts in coordinating medication access by completing benefits investigations and prior authorizations and enrolling patients in manufacturer savings programs. Incorporating an ambulatory care pharmacist to implement a consistent workflow for seamless medication authorization and procurement is expected to enhance patient access to antirheumatic therapies, reduce time to therapy initiation, and improve patient outcomes.

**Methods:** In September of 2021, an ambulatory care pharmacist began receiving referrals from one rheumatology provider to pilot implementation of a medication authorization and procurement workflow. This workflow consisted of conducting benefits investigations to determine whether medications would be covered through pharmacy or medical benefits, submitting prior authorizations if needed based on insurance requirements, sending prescriptions to anticipated pharmacies, enrolling patients in manufacturer savings programs, and coordinating medication acquisition with patients. The primary outcome was the percentage of patients with medications coordinated at the hospital's in-house pharmacy or infusion center.

**Results:** There were 48 patients referred from September 27, 2021 to January 27, 2022. Half of these patients had commercial insurance, and 69% of medications were coordinated through pharmacy benefits. The most common referrals were for adalimumab and rheumatoid arthritis. Approximately 41% of patients who initiated therapy had their medications coordinated at the hospital's in-house pharmacy (21%) or infusion center (21%). By March 27, 2022, 71% of patients had initiated therapy.

**Conclusions:** All referrals were investigated in a timely manner. Majority of medications initiated by patients were filled at outside pharmacies due to insurance requirements. However, substantial revenue was generated by coordinating medications at the hospital's in-house pharmacy or infusion center. The goal is to expand these services to support additional rheumatology providers, including those at the hospital-based rheumatology clinic, which would
allow for purchasing of specialty medications at 340B pricing and a larger generation of revenue. This is also anticipated to confer clinical benefits by maintaining continuity of care and ensuring timely coordination of authorization renewals and medication procurement.
Impact of medication management pharmacy services on patients recently admitted with diabetic ketoacidosis

**Objectives:** Diabetic ketoacidosis (DKA) is a serious complication for individuals with diabetes characterized by hyperglycemia, metabolic acidosis, and ketosis. While DKA commonly occurs in patients with type 1 diabetes, about a third of the cases are composed of type 2 diabetes patients. In the inpatient setting, upon management of DKA, patients at discharge are often started with a basal-bolus analog insulin regimen. While these treatment options are highly efficacious, factors such as cost, poor adherence, and lack of adequate patient education make basal and bolus insulin regimens become burdensome for patients. Pharmacists in the Medication Therapy Management (MTM) role are essential to improve patient-specific medication regimens with possible de-escalation of insulin to non-insulin therapy and prevent further episodes of DKA hospitalizations. This retrospective study will aim to look at patients who are referred to a MTM pharmacy clinic post-DKA hospital admission and the impact that the MTM pharmacist was able to make on lowering their Hemoglobin A1c (HbA1c) and also the reduction in a 30-day rehospitalization for DKA.

**Methods:** A retrospective review was completed using medical record information of patients who had an episode of DKA across all Geisinger healthcare facilities within a 5-year period were reviewed. Each patient was evaluated to determine if they were discharged on insulin at discharge and if the patient was followed by an MTM pharmacist post-discharge. Guidelines assessed included HbA1c as defined by the ADA Guidelines.

**Results:** The number and percentage of patients that displayed reduction in HbA1c and were transitioned to a non-insulin therapy after being following by a pharmacist will be recorded and results will be presented.

**Conclusions:** It is anticipated that this project will demonstrate a role for MTM pharmacists post-DKA hospital admission in lowering patient's HbA1c, transitioning from insulin regimen to non-insulin regimen, and reducing of 6-month re-hospitalization rate.
**Presenter Name:** Perfetto, Aaron  
**Organization:** Providence Veterans Affairs Medical Center  
**Category:** Ambulatory Care  
**Day | Session | Room | Time:** Tuesday | 4 | Wild Rose B | 2:45:00 PM

**Authors:** Aaron Perfetto, PharmD; Alissa Scalise, PharmD, BCPP, BCPS

**Title:** Evaluation of Antihypertensive Therapy and Vascular Risk Factor Management in Secondary Stroke Prevention Among Veterans Following an Ischemic Stroke

**Objectives:** Recurrent ischemic strokes account for almost 25% of strokes that happen annually, occurring more frequently during the first year after an initial event. More than a third of people who have a transient ischemic attack (TIA) and do not get treatment will experience a major stroke within 1 year. Existing guidelines recommend an office blood pressure goal of < 130/80mmHg in patients who experience an ischemic stroke or TIA to reduce the risk of recurrent event. Additional management of vascular risk factors including diabetes, smoking cessation, and hyperlipidemia is also important. The purpose of this study is to describe hypertension management after hospitalization for an ischemic stroke/TIA amongst Veterans enrolled at Providence Veterans Affairs Healthcare System, and to identify any barriers to optimal post-stroke outpatient management.

**Methods:** A retrospective chart review will be conducted for Veterans diagnosed with an ischemic stroke or TIA who had at least one primary care visit at the Providence Veterans Affairs Healthcare System during the one-year post-event. Veterans who were diagnosed with hemorrhagic stroke or ischemic stroke of known cardioembolic source will be excluded. The primary endpoint will evaluate the proportion of patients who have adequate blood pressure control defined as an average office blood pressure <130/80mmHg and to describe interventions at primary-care visits. Through further chart review, other vascular risk factors such as management of concomitant comorbidities like diabetes mellitus, smoking cessation, lipid management, antiplatelet therapy, and medication adherence will be examined. Outcomes including recurrent stroke/TIA, rehospitalization, and medication adherence will also be assessed. This study will also plan to describe the health-care services received, including visits to specialty clinics or ancillary services.

**Results:** Results will be presented at the Eastern States Conference in May of 2022.

**Conclusions:** It is anticipated that this project will describe hypertension management after hospitalization for an ischemic stroke or TIA amongst Veterans enrolled at Providence Veterans Affairs Healthcare System, and to identify any barriers to optimal post-stroke outpatient management.
Comparison of the effect of antiretroviral therapies on metabolic complications in patient with Human Immunodeficiency Virus

Authors: Haley Pressley, Caitlin Prather, Cyrille Cornelio, Erin Adams

Title: Comparison of the effect of antiretroviral therapies on metabolic complications in patient with Human Immunodeficiency Virus

Objectives: Human immunodeficiency virus (HIV) is a global epidemic that infects 34,800 new individuals annually. The first antiretroviral medications came with life altering side effects and were only modestly effective, while newer therapies contain fewer debilitating side effects and demonstrate high efficacy. Despite the advancements, antiretroviral therapy does not come without known metabolic side effects. The aim of this study is to determine the effect of antiretroviral therapy in patients newly started on therapy and those who switch antiretroviral therapy regarding weight gain, body mass index, cholesterol, blood pressure, and hemoglobin A1C.

Methods: Patients selection included 100 randomly selected patients over 18 currently on antiretroviral therapy at Inova Juniper HIV Clinic. Patients who were non-adherent to antiretroviral therapy (defined as deviation from prescribed regimen for one month or greater) were excluded from this study. Data collection was conducted by the pharmacy resident as a retrospective chart review. Hemoglobin A1c, blood pressure, lipid panel, body mass index (BMI), and weight was compared from the initiation or switch of antiretroviral therapy to various time frames (6 months, 1, 2, 3, 4, 5, and 10 years) after antiretroviral therapy initiation or switch. Patient demographics including age, gender and ethnicity were collected. Confounding variables including smoking status, statin use, antihypertensive agents, and antidiabetic agents were recorded. Patients who switch therapies during any time were included as another data point for therapy switch comparison. Group comparisons were performed by t-test or chi-square, where appropriate. Separate repeated measures linear mixed models were used to assess changes in parameters over time.

Results: Of the 100 patients selected, 44% were African American, 36% Hispanic, 10% White, 2% Asian, and 8% Other. Average patient age was X with 65% of them being male. Overall, patients on integrase strand inhibitor (INSTI) therapy showed an increase in LDL cholesterol from baseline to final lab value, +9.55 and -3.19 mg/dL (p=0.065) for INSTI vs non-INSTI therapy respectively. Total cholesterol went up by 17.54 mg/dL in INSTI therapy versus down by 4.51 mg/dL in non-INSTI therapy (p=0.0072). Patients on or switched to tenofovir disoproxil fumarate (TDF) had an average weight gain of 4.96 kg versus 0.1 kg weight gain in patients with...
tenofovir alafenamide fumarate (TAF) (p=0.296) Systolic and diastolic blood pressure did not reveal any significant difference over time in INSTI vs non INSTI therapy and TDF vs TAF therapy.

**Conclusions:** This study is the first of its kind to compare various HIV regimens and switches in regards to weight and cardio-metabolic changes in all patients treated within an HIV clinic in northern Virginia. Prior studies have looked at each of these components individually or in a certain subset of patients. Results from this study will help pave the way for future studies to analyze specific patient demographics that may influence antiretroviral therapy medication selection. There will also be an area for future study to determine expected metabolic and weight changes to be expected with such therapy.
Prine, Lucas

Evaluating and closing gaps in care for patients treated for heart failure with reduced ejection fraction in a rural health clinic.

Conference Abstracts
May 16-18, 2022

Presenter Name: Prine, Lucas
Organization: WVU Medicine - Jefferson Medical Center
Category: Ambulatory Care
Day | Session | Room | Time: Tuesday | 3 | Crystal A | 2:00:00 PM

Authors: Lucas Prine, PharmD., Seth Lilly, PharmD., BCPS.

Title: Evaluating and closing gaps in care for patients treated for heart failure with reduced ejection fraction in a rural health clinic.

Objectives: Utilizing pharmacy outreach within a rural health clinic positively affects guideline-focused prescribing practices in patients with heart failure with reduced ejection fraction. This project identified gaps in current prescribing practices and aimed to close those gaps.

Methods: Using current ACC/AHA guidelines, the pharmacy resident created treatment plans alongside the medical provider to improve prescribing practices. Pertinent information used for treatment decision making included: vitals (range of last five heart rates, average of last five blood pressures), laboratory findings (last three recorded serum potassium levels), current eGFR/CKD staging status if applicable, most recent left ventricular ejection fraction, and left ventricular ejection fraction at diagnosis. The pertinent medications currently used by the patient and an extensive chart review of previously trialed regimens were discussed at length with the medical provider to further assist in treatment plans.

Results: The expected results of this project will show a positive impact a pharmacist can make on guideline-focused prescribing practices in a rural health clinic. It is also expected these results will reflect effective utilization of the new medications sacubitril/valsartan, empagliflozin, and dapagliflozin amongst the patients evaluated in this Phase 2 project. Official results will be stated upon conclusion of this research.

Conclusions: The authors predict this data will provide additional proof that pharmacist intervention in the outpatient setting can improve prescribing practices, clinical outcomes, provide patient-centered advocacy, and potentially reduce financial burden on the healthcare system by reducing cardiovascular events and hospitalizations. The authors anticipate this project will also highlight the need for pharmacist-led education on heart failure with reduced ejection fraction by showcasing the myths of low-normal blood pressure as a marker for maximally tolerated titration with our medications.
Impact of continuous subcutaneous insulin infusion pumps on clinical outcomes of diabetic patients

**Objectives:** Diabetes has been on the rise for many years in the United States in which the prevalence has tripled since 1980. Advancements in technology have opened new doors of effective management for patients with diabetes. Subsequently insulin therapy is the treatment standard for Type 1 diabetes, while commonly being utilized in Type 2 diabetes. Developments in insulin pumps (IP) and continuous glucose monitors (CGMs) provide diabetic patients a new means of managing insulin therapy as compared to multiple daily injections (MDI). IP therapy is regarded as a more precise method of insulin while improving patient safety with improvements in glycemic control compared to MDI. However, there is limited information on how glycemic control differs between different IP. We seek to assess if there are differences in clinical outcomes between diabetic patients utilizing different IP currently in the market.

**Methods:** This was a retroactive chart review of patient medical records and CGM reports across three different physician groups throughout 2021. Patients were separated into one of the three cohorts based on which IP they utilized: Tandem, Omnipod, Medtronic. Inclusion criteria is as follows: 18 years or older, diagnosis of T1DM or T2DM, on an IP. Patients were excluded if they were not using a CGM, pregnant, CKD stage 4,5, or dialysis. The primary outcome is to compare differences in A1C between cohorts. The secondary outcome is to compare the following CGM glycemic parameters: time in range, time in hypoglycemia, time in severe hypoglycemia. ANOVA analysis was used to assess the differences between continuous variables between the three cohorts.

**Results:** In total there were 59 patients in the Tandem cohort, 37 patients in the Omnipod cohort, and 39 patients in the Medtronic cohort. Change in A1C from baseline did not differ significantly between cohorts (p = 0.634). CGM report data showed that patients on Tandem pumps spent more time in glycemic range (68.5%, 60.2%, 58.0%; p = 0.026) and less time in hypoglycemia compared to (1.5%, 2.9%, 1.9%; p = 0.032) compared to patients on Omnipod and Medtronic IP respectfully. Time in severe hypoglycemia did not differ between cohorts (p = 0.868).
**Conclusions:** The data suggest that current IP on the market lead to similar improvements in A1C. CGM report data suggest that patients on Tandem IP spend more time in glycemic range and less time in hypoglycemia compared to those on Omnipod and Medtronic IP.
Evaluating the Impact of Embedding an Ambulatory Care Pharmacist in an Outpatient Cardiology Clinic

Objective: Atrial fibrillation is a medical condition that affects many worldwide and requires proper treatment and management to prevent stroke and other heart-related complications. Previous studies support the role of pharmacy involvement in improving patient outcomes. Valley Health System’s Snyder Center for Comprehensive Atrial Fibrillation is at the forefront of innovative and effective practice by providing a comprehensive, team-based approach to management of atrial fibrillation. The purpose of this study is to evaluate the clinical impact of incorporating an ambulatory care pharmacist to the care team in an outpatient cardiology clinic by assessing the effectiveness of a pharmacist-led medication reconciliation. The primary outcome is the number of medication discrepancies identified by pharmacists over the course of the study.

Methods: This is a prospective single-arm intervention study that served as a pilot program conducted in an outpatient cardiology clinic over the span of six weeks. Patients were included if they had a scheduled office visit with the providers in the outpatient cardiology clinic between November 8, 2021 to December 17, 2021. Patients were excluded if they had a virtual appointment with the provider and did not respond to the pharmacist phone call, had an appointment for a device check or surgical procedure, or canceled their appointment. The role of the pharmacy team is to call patients before their scheduled appointment or to speak with them in the clinic prior to the provider to conduct a comprehensive medication reconciliation and chart review, identify any drug-drug interactions or inappropriate dosing regimens, educate and counsel patients on their medications, and relay any pertinent information and provide recommendations to their providers. The primary outcome is the number of medication discrepancies identified. Secondary outcomes include types of discrepancies, number of pharmacist-provider clinical interventions made, and number of patients that required medication education.

Results: The pharmacy team identified 4546 medication discrepancies among 1084 patients, or in approximately 86% of the patient population. Of the 4526 medication discrepancies, pharmacists identified 84 drug-drug interactions, 27 duplicate therapies, 23 medications that required renal dose adjustments, 1 medication that required hepatic dose adjustment, 1167
medications that needed to be added to patient charts, 970 medications that were changed, and 2274 that were discontinued. A clinical intervention was made for 103 patients and medication education and counseling was conducted for 239 patients.

**Conclusions:** This study suggests that integrating a pharmacist into the care team offers a valuable resource with substantial benefits to both the patients as well as the staff at an outpatient cardiology clinic by improving workflow efficiency, medication adherence, and patient outcomes.
**Title:** Rapid infusion time of infliximab biosimilars and the rate and severity of infusion-related reactions in patients with inflammatory bowel disease

**Objectives:** Infliximab is an anti-tumor necrosis factor agent used in the treatment of inflammatory bowel disease (IBD). There are currently four FDA-approved infliximab biosimilars on the market, providing cost savings for patients and payers. Shortening the length of infliximab infusions from 120 minutes (standard infusion) to 60 minutes or less (rapid infusion) has been shown to safely provide cost saving opportunities, however this has nearly exclusively been studied in the infliximab originator product. The purpose of this study is to compare the rate and severity of infusion reactions between rapid infusion of infliximab biosimilars and originator infliximab.

**Methods:** This was a retrospective analysis of electronic health record data of patients with a diagnosis of IBD receiving an infliximab or infliximab biosimilar infusion between December 1st, 2020 to December 1st, 2021. Patient-level variables included IBD diagnosis, demographics, immunomodulator use, hospitalizations for IBD flares, and infliximab trough and antibody levels. Infusion-related variables include total infusions, drug, dose, dosing interval, infusion time, and use of pre-medications. Infusion-related reactions were defined as anaphylaxis, shortness of breath, hypotension, swelling, rash, pruritus, hives, flushing, chest pain, muscle pain, joint pain, fevers, chills, headache, or hypertension recorded by the infliximab-administering nurse within 1 hour following the end of infusion. Fisher's exact test was used to compare reaction rates.

**Results:** There were 151 patients meeting inclusion criteria for analysis, with a total of 904 infusions administered during the study time period. There was no significant difference in the occurrence of infusion reactions between rapid infusion infliximab biosimilars (0.0%) and rapid infusion of originator infliximab (0.5%). Likewise, the proportion of infliximab biosimilar infusions that had reactions was not statistically different between standard (1.9%) and rapid infusions (0.0%). No infusions resulted in severe reactions.

**Conclusions:** There was no difference in rate or severity of infusion reactions between rapid infusion infliximab biosimilars and rapid infusion originator infliximab, or the rapid infusion of infliximab biosimilars versus standard infusion of infliximab biosimilars.
Title: The effect of a pharmacy-driven urinalysis and urine culture recall service within a primary care clinic

Objectives: Urinary tract infections are common infections seen in the outpatient setting. Providers are responsible for prescribing guideline recommended empiric antibiotics when indicated. Pharmacists can aid in the prevention of antibiotic resistance by evaluating laboratory results and symptoms to make recommendations to initiate, discontinue, or adjust therapy.

Methods: A retrospective chart review assessed patients presenting to a primary care clinic with orders for UA/reflex UC, UA with microscopic examination and culture-urine to assess the effectiveness of a pharmacist intervention service. The service was reviewed from Oct 2021 - Feb 2022 and consists of a daily review of labs ordered and resulted within the previous 7 days. Patients reviewed prior to Oct 2021 were reviewed only by physicians and will serve as the pharmacy service comparator. Excluded patients are those <18 years of age or did not complete the labs. The primary objective is to assess if a pharmacy intervention service decreases inappropriate or unnecessary antibiotic use. Secondary objectives include: improved time to laboratory review, and acceptance and implementation of interventions. The primary endpoint is the percent of inappropriate or unnecessary antibiotics prescribed, pre versus post the pharmacy service. Secondary endpoints include: percent of patients with acceptance and implementation of interventions, and time to UA and UC review.

Results: In the physician review arm, 17 of 19 antibiotics sent (89.5%) were unnecessary or inappropriate versus 6 of 8 (75%) in the pharmacy service arm. Pharmacist review also led to 3 (42.9%) successful interventions for discontinuation and initiation of therapy, with 4 (57.1%) unsuccessful interventions as patients had already completed their treatment course. However, with solely physician review, 22 interventions were needed in 13.5% of patients. When comparing simultaneous physician review (n=163) to pharmacist review (n=46), the average time to review UA/urine dipsticks was 60.59 and 1.93 days respectively, and for UC it was 47.95 and 1.85 days respectively. Urine dipsticks were underutilized: 4.9% of patients in the physician review arm with none used during pharmacist review.
Conclusions: Implementation of a pharmacy intervention service demonstrated a reduction in incorrect antibiotic use and a shorter time to review lab results. The service ensures patients are appropriately treated and in a timely manner. A shift to urine dipstick can be considered moving forward to prevent the prescribing of unnecessary antibiotics, and decrease antibiotic resistance.
Use of Midodrine to Achieve Target Doses of Guideline-Directed Medical Therapy in Patients with Heart Failure with Reduced Ejection Fraction

**Objective:**
- The objective of this study is to evaluate the use of midodrine, an alpha agonist used to treat hypotension, as a means to achieve target doses of guideline-directed medical therapy (GDMT) in patients with heart failure with reduced ejection fraction (HFrEF). GDMT for HFrEF includes a renin-angiotensin aldosterone system (RAAS) inhibitor, a beta blocker, a mineralocorticoid receptor antagonist (MRA), and a sodium-glucose cotransporter-2 (SGLT-2) inhibitor.

**Methods:**
- A retrospective chart review was performed on patients 18 years of age or older who were initiated and continued on midodrine for at least 30 days for the purpose of achieving GDMT target doses. Patients were excluded if midodrine was used acutely in the hospital setting, if their dosing frequency varied from three times daily, or if they were on midodrine only on dialysis days. Wilcoxon signed-rank tests were used for statistical analysis for ordinal and continuous, non-parametric variables.

**Results:**
- Between October 1, 2019 and September 30, 2021, 49 patients met inclusion criteria. If patients were on more than one dose of midodrine during the study period, each was counted separately, resulting in 69 unique prescriptions. At baseline, 81.2% of patients were on a RAAS inhibitor, 94.2% were on a beta blocker, and 63.8% were on an MRA. Based on interim results, initiation of midodrine resulted in a statistically significant mean increase of 4.6% (P=0.011) in RAAS inhibitor dose, and non-significant reductions in beta blocker and MRA doses. Fully optimized GDMT at 100% of target doses of all medications was not achieved for any patients that were included in this study. Non-significant findings included a median increase of 5% in ejection fraction and a mean reduction in pro-BNP of 568 pg/mL after midodrine initiation. Of the 68 patients who had systolic blood pressures taken at their first follow-up visit after midodrine was prescribed, 55.1% had an increased reading. Of note, 34.8% of patients were on an SGLT-2 inhibitor at the time of inclusion in this study.

**Conclusions:**
- Based on the results of this study, it appears that initiation of midodrine may allow uptitration and/or continuation of GDMT for HFrEF while avoiding adverse symptomatic hypotension.
Evaluation of outcomes for patients with type 2 diabetes mellitus following implementation of an ambulatory care pharmacist driven service in an endocrinology clinic

**Objectives:** Type 2 diabetes mellitus (T2DM) is one of the most common disease states in the United States, leading to significant morbidity and mortality. The Centers for Disease Control and Prevention reports that more than 34 million Americans are living with diabetes mellitus and 90-95% of those are diagnosed with T2DM. In 2019, an estimated 1.4 million patients were newly diagnosed, and despite the increase in diagnoses, there is a shortage of endocrinologists available to provide disease state management. The implementation of an ambulatory care clinical pharmacist directly into an endocrinology clinic setting has been shown to significantly reduce hemoglobin A1c levels in patients with T2DM. A collaborative drug therapy management (CDTM) service, allows pharmacists to co-manage patients seen in clinic. Pharmacists can add, remove, or adjust medications for T2DM and frequently follow-up with patients. This study aims to evaluate reductions in hemoglobin A1c levels in patients managed by the ambulatory care clinical pharmacist in an endocrinology clinic.

**Methods:** A CDTM service was established in the Luminis Health endocrinology clinic in June 2021. An IRB approved, single-center, retrospective study was performed for all patients with T2DM who were co-managed by the ambulatory care clinical pharmacist. Electronic medical records of patients seen between June 2021 - January 2022 were reviewed, and data elements were collected, de-identified, and stored in a customized and access-protected database. Data elements include: onset of T2DM, baseline and current hemoglobin A1c levels, prior hospitalizations related to T2DM, statin use, medications for T2DM pre and post-pharmacist intervention, and comorbid conditions. The primary endpoint was analyzed using a paired t-test statistical analysis and all other data points were analyzed using descriptive statistics.

**Results:** A total of 95 patients with T2DM were reviewed. 53 patients (55.8%) repeated a hemoglobin A1c post-pharmacist intervention, and a reduction in hemoglobin A1c was observed in 48 patients (90.6%). The average hemoglobin A1c pre-pharmacist intervention was 10.9% and post-pharmacist intervention was 7.9% and reductions in hemoglobin A1c were statistically significant (p <0.0001). Additional results will be presented.
**Conclusions:** Implementation of a pharmacist driven CDTM service within an endocrinology clinic resulted in significant reductions in hemoglobin A1c for patients with T2DM. This study demonstrates that clinical pharmacists can provide effective interventions for a complex patient population which has a documented shortage of specialty healthcare providers.
**Conference Abstracts**  
May 16-18, 2022

**Presenter Name:** Sherwood, Bryan  
**Organization:** Dartmouth-Hitchcock Medical Center (DHMC)  
**Category:** Ambulatory Care  
**Day | Session | Room | Time:** Tuesday | 3 | Crystal A | 1:15:00 PM

**Authors:** B. Sherwood, M. Hill, L. Foss, L. Sargent; Dartmouth-Hitchcock Medical Center (DHMC), Lebanon, New Hampshire

**Title:** Clinical outcomes of primary care pharmacist collaborative practice

**Objectives:** The development of collaborative practice agreements (CPAs) enables pharmacists to manage patients more directly. Prior studied outcomes indicate that patients with diabetes managed by a pharmacist have lower A1C, decreased diabetes related hospitalizations, and an increased number of diabetes treatment interventions. This project hopes to gather insight into the difference ambulatory care pharmacists with a collaborative practice agreement can make in the health of patients with diabetes within the primary care setting.

**Methods:** Medical record review and hospitalization data reports were utilized to gather data from January 1st, 2020 to June 30th, 2021. Two cohorts of patients were selected for comparison of CPA enrolled and non-CPA enrolled patients based on enrollment status. Included patients must have had a diagnosis of type 2 diabetes, and be managed in the primary care setting. Objectives of the data analysis include assessment of the difference in A1C over one year between patients managed by a pharmacist with a CPA and patients without a pharmacist on their care team. Additionally, the two cohorts will be analyzed for differences in the number of diabetes related hospital admissions and emergency department visits, as well as healthcare costs related to healthcare system utilization.

**Results:** The difference in A1C over one year, total number of diabetes and non-diabetes related hospital and emergency department visits, and the difference in healthcare costs due to healthcare system utilization will be collected and calculated for the two cohorts. Comparison of the two cohorts will be conducted and the results will be presented.

**Conclusions:** It is anticipated that the project will reveal the impact that a pharmacist with a collaborative practice agreement can have on the health of patients with diabetes. It is the hope of the authors that the results of this project will be utilized for departmental planning and to advocate for pharmacist collaborative practice.
Evaluating the effect of timing on point-of-care testing of INR

Pharmacists working under a collaborative drug therapy management agreement may be allowed to monitor patients on vitamin K antagonist therapy (eg. warfarin) utilizing Point-of-Care Testing (POCT) of International Normalized Ratio (INR). Although the package insert of the CoaguChek® XS POC INR machines utilized in clinic indicates to obtain blood samples within 15 seconds of lancing the finger, oftentimes, it may be difficult to obtain blood in that period of time. The objective of this study is to evaluate if there is a difference in INR readings taken within the 15 second time frame after lancing the finger versus INR readings taken after 15 seconds of lancing the finger in patients on warfarin therapy.

Methods: All adult patients on anticoagulation therapy with warfarin who are managed in a pharmacist-run anticoagulation clinic will be considered for this study. Any patient who has an INR reading of less than 1.2 or who are unable to provide both INR readings will be excluded from the study. Once written informed consent is obtained, each patient will receive an INR reading utilizing a POC INR machine within the first 15 seconds of capillary puncture as a part of standard of care. Utilizing the same puncture, a second INR reading will be obtained after a new drop of blood has been sitting on the patient's finger for 30 to 60 seconds. The primary outcome is the mean difference of INR readings taken less than 15 seconds and between 30 to 60 seconds after the blood drop has been attained from the finger. Descriptive statistics and paired T-test will be utilized to evaluate demographic data and the primary endpoint outcomes, respectively.

Results: The difference in INR readings taken less than 15 seconds and between 30 to 60 seconds after the blood drop has been attained from the finger will be recorded, assessed, and presented.

Conclusions: It is anticipated that timing of obtaining blood post capillary puncture for POCT of INR will have an effect on INR readings in patients on anticoagulation therapy with warfarin.
**Title:** Impact of a pharmacist-driven multidisciplinary protocol in optimizing sodium-glucose co-transporter-2 inhibitors in clinical practice

**Objectives:** Sodium-glucose co-transporter-2 inhibitors (SGLT2i) are a class of medications that were introduced to clinical practice as antihyperglycemic agents. Despite guideline updates and novel FDA-approved indications, including chronic kidney disease (CKD) and heart failure (HF) with or without type II diabetes mellitus (T2DM), many healthcare professionals continue to experience clinical inertia when prescribing SGLT2i. The aim of this project is to prescribe SGLT2i in 20% of eligible patients across targeted ambulatory care clinics (primary care and cardiology) at Boston Medical Center by April of 2022.

**Methods:** This quality improvement project applies the Institute for Healthcare Improvement Model. Changes will be implemented using Plan-Do-Study-Act (PDSA) cycles. Pharmacy residents, in collaboration with project preceptors, and physician stakeholders developed a multidisciplinary, pharmacist-driven SGLT2i initiation and monitoring protocol. In the outpatient setting, select provider panels were screened between the months of December 2021 and March 2022. Per protocol, patients with CKD stages II-IV or HF with or without T2DM and patients with T2DM and established cardiovascular disease were included. Patients with a history of recurrent genitourinary infections, diabetic ketoacidosis, type 1 diabetes mellitus, or those on dialysis were excluded. Patients were monitored at 1 and 2 months to ensure tolerance and adherence. Medications were adjusted per protocol when indicated. In the inpatient setting, cardiology and heart failure care teams were screened between the months of September 2021 and March 2022 using the same criteria. Eligible patients were either referred to a pharmacist in the HF clinic for medication optimization or were prescribed a SGLT2i upon discharge.

**Results:** In the outpatient setting, 32 patients were found eligible for SGLT2i initiation for a compelling indication, and 9 patients (28%) were started on a SGLT2i. None of the patients who started SGLT2i discontinued treatment due to side effects thus far. Major barriers to start included: provider deferred for future visit (21%), no show to appointment (12.5%), non-adherence to current regimen (6.25%). In the inpatient setting, 16 patients with HF were discharged with a new prescription for a SGLT2i, at baseline (September 2020 to July 2021).
Since then, this number has doubled, with 41 patients with HF discharged with new prescriptions.

**Conclusions:** It is anticipated that this project will demonstrate a role for pharmacist-based optimization of SGLT2i use in clinical practice by identifying and initiating eligible patients on these agents, providing education, and conducting close follow-up.
Impact of a pharmacist-driven multidisciplinary protocol in optimizing sodium-glucose co-transporter-2 inhibitors in clinical practice

**Objective**: Sodium-glucose co-transporter-2 inhibitors (SGLT2i) are a class of medications that were introduced to clinical practice as antihyperglycemic agents. Despite guideline updates and novel FDA-approved indications, including chronic kidney disease (CKD) and heart failure (HF) with or without type II diabetes mellitus (T2DM), many healthcare professionals continue to experience clinical inertia when prescribing SGLT2i. The aim of this project is to prescribe SGLT2i in 20% of eligible patients across targeted ambulatory care clinics (primary care and cardiology) at Boston Medical Center by April of 2022.

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Since then, this number has doubled, with 41 patients with HF discharged with new prescriptions.

**Conclusions:** It is anticipated that this project will demonstrate a role for pharmacist-based optimization of SGLT2i use in clinical practice by identifying and initiating eligible patients on these agents, providing education, and conducting close follow-up.
Impact of interventions made by a clinical pharmacist in an outpatient family medicine clinic

**Objectives:** Medication misuse and errors lead to significant wastage of healthcare dollars. Pharmacists possess the skills and training required to thoroughly evaluate medication regimens to recognize care gaps, assess medication adherence, identify suboptimal or incorrect therapy and subsequently, recommend appropriate therapy alternatives. By optimizing patient care, pharmacists can slow or prevent disease exacerbation. This avoids unnecessary escalation of care and the costs associated with it. The aim of this study is to demonstrate the positive impact of pharmacist involvement in the overall care of patients at an outpatient family medicine clinic.

**Methods:** In this study, the main source of data is the "I-Vent" documentation feature and progress notes from the EPIC® electronic medical record system. We are evaluating all documented interventions and progress notes entered during the care of patients at a family medicine primary care clinic during the study timeframe.

**Results:** The interventions documented by a clinical pharmacist during our study period (November 2021-January 2022) at the clinic will be included in the study. The interventions will be evaluated and categorized to identify areas of impact and the results will be presented at the Eastern States Conference.

**Conclusions:** The study evaluated the interventions made by a clinical pharmacist from November 2021-January 2022. It is anticipated that the results of this study will highlight the beneficial impact on patient outcomes that occurs due to pharmacist involvement in the ambulatory care workflow.
Comparing deprescribing of stress ulcer prophylaxis in a nurse practitioner staffed medical intensive care unit vs resident staffed medical intensive care unit

**Objectives:** The objective of the study is to compare the appropriateness of deprescribing of stress ulcer prophylactic agents between a nurse practitioner staffed medical intensive care unit and a resident staffed medical intensive care unit. The number of critically ill patients requiring care in an acute care setting has increased. Nurse practitioners have taken on a larger role in the clinical workforce to help manage the needs of critically ill patients. However, there are not many studies comparing patient outcomes in nurse practitioner staffed medical intensive care unit. Our study will contribute to the literature on the importance of deprescribing stress ulcer prophylactic agents. We have hypothesized that the nurse practitioner led medical intensive care unit will have better rates of stress ulcer prophylaxis deprescribing compared to the resident led medical intensive care unit.

**Methods:** This study is a retrospective, single-center chart review at an academic medical center. Charts will be reviewed from patients admitted to two different medical intensive care units, 3-Southeast and 5-East. The charts will be reviewed until the patient is discharged from each medical intensive care unit. Patients will be included in the study if they are eighteen years of age or older, admitted to the medical intensive care unit, and who are mechanically ventilated for greater than 48 hours. The exclusion criteria is as follows: admission diagnosis of a gastrointestinal bleed; history of a gastrointestinal bleed; diagnosis of gastroesophageal disease, acute Helicobacter pylori infection, peptic ulcer disease, Zollinger-Ellison, or Barrett's Esophagus; presence of a proton pump inhibitor or histamine-2 receptor antagonist on patient's prior to admission medication list; hypersensitivity to a proton pump inhibitor or histamine-2 receptor antagonist; pregnancy. The study will be a comparison of two patient groups. One group will be patients in the 3-Southeast medical intensive care unit managed by nurse practitioners and the comparator group will be patients in the 5-East medical intensive care unit.

**Results:** The results will be recorded, analyzed, and presented at the conference. The primary objective is to compare the rates of deprescribing of stress ulcer prophylactic agents between a nurse practitioner staffed medical intensive care unit and a resident staffed medical intensive care unit.
Conclusions: Furthermore, our study findings will aim to provide education to providers to improve inappropriate continuation of stress ulcer prophylactic agents and possibly lead to changes in the current hospital guidelines and show the benefit of a pharmacist on a rounding team.
**Conference Abstracts**
May 16-18, 2022

**Presenter Name:** Umoren, Edidiong  
**Organization:** Howard University Hospital; Howard University College of Pharmacy  
**Category:** Ambulatory Care  
**Day | Session | Room | Time:** Wednesday | 6 | Wild Rose B | 4:30:00 PM

**Authors:** Edidiong Umoren, PharmD, MPH; Sanaa Belrhiiti, PharmD, BCPS, BCCCPS; La'Marcus T. Wingate, PharmD, PhD; Eyerusalem Ayele, PharmD Candidate; Bryanna Haynes, PharmD Candidate; Salome Weaver, PharmD, BCGP, FASCP

**Title:** Retrospective evaluation of the prescribing of naloxone and number of morphine milligram equivalents in patients with SCD at an ambulatory care clinic

**Objectives:** Opioids are the mainstay of chronic pain management in patients with sickle cell disease (SCD). Opioid use remains more widely studied in cancer populations in comparison and there exists a scarcity of clinical studies that highlight the challenges surrounding opioid use in the SCD population. The objective of this study is to examine the prescribing practice of naloxone for acute utilization in SCD patients and number of morphine milligram equivalents (MME) at an ambulatory care clinic in the Washington Metropolitan area.

**Methods:** This was a retrospective observational study conducted at an ambulatory care clinic in the greater metropolitan Washington area. The primary independent variable was the number of morphine milligram equivalents (MME) while the dependent variable was the prescribing of naloxone. Descriptive statistics, linear regression and multivariate logistic regression analysis were conducted using SPSS version 28.

**Results:** A total of 100 participants were recruited from January 1, 2019, to September 30, 2021, and all were included in the analysis. The total mean of MME for all participants was 118.8 ±86.4. Approximately 23% of participants had a daily calculated MME of less than 90, 32% had MMEs between 90 and 120 and 45% had MMEs greater than 120. Approximately 19% had been prescribed naloxone and out of these, 16% received naloxone. After adjusting for other factors, a positive urinary analysis (UA) was predictive of 5.24 times odds of receiving a prescription of naloxone compared to those without a positive UA and this result was statistically significant with a p value of 0.018.

**Conclusions:** The study highlights a gap between the prescribing of naloxone in a patient population that primarily depends on opioids for management of acute and chronic pain. Further education is required to encourage patients to obtain naloxone from their local pharmacy as it is free and accessible to them as residents.
Continuous Glucose Monitoring Implementation in a Rural Health Clinic

Authors: Shani Vildbaum, PharmD., Seth Lilly, PharmD. BCPS

Title: Continuous Glucose Monitoring Implementation in a Rural Health Clinic

Objectives: Continuous Glucose Monitoring (CGM) allows patients to discover unknown hypo/hyperglycemia, measure glycemic control directly in real time, measure the percent of time within, below, or above target levels, and the severity of hypo/hyperglycemia. The development of a CGM provides patients with the opportunity to improve glycemic control, help patients better manage their disease, and reduce complications that are associated with prolonged hyperglycemia. The purpose of this study is to increase the use of CGM to better patient care and improve disease state management in a rural health clinic.

Methods: Retrospective baseline data was collected from an EMR of diabetes seen between January 2020 to October 2021. Inclusion criteria: A1c >7%, diagnosis of Type 2 Diabetes, >18 years old. Exclusion Criteria: Type 1 Diabetes, gestational diabetes. Patients not currently using CGM will be contacted to assess interest. Monthly monitoring to assess glucose markers and medication adherence. These measures will be compared before and after implementation of CGM.

Results: Patients on CGMs will be assessed for adherence and measure monitoring of glucose markers. Measures will include A1c trend, glucose levels (including percentage of readings out of range), as well as assessing medication changes after CGM implementation and pertinent comorbidities.

Conclusions: It is anticipated that implementation of CGMs and consistent follow up by a pharmacist will increase patient understanding and management of their diabetes resulting in more controlled blood sugars.
Conferences Abstracts
May 16-18, 2022

Presenter Name: Vitali, Lily
Organization: Lahey Hospital & Medical Center
Category: Ambulatory Care
Day | Session | Room | Time: Poster

Authors: L. Vitali, S. Howard, K. Peng; Lahey Hospital & Medical Center, Burlington, MA

Title: Implementation and evaluation of a pharmacist-led antidepressant follow-up telehealth service

Objectives: Many patients with depression will be prescribed an antidepressant at some point; however, over a third will self-discontinue within the first month. Pharmacists are uniquely positioned to provide recommendations related to adherence, side effect management, administration time, dose adjustments and alternative therapies. Furthermore, psychiatric medication initiation requires close follow-up, for which ambulatory care pharmacy specialists embedded in primary care may be able to relieve some of this burden. This project seeks to evaluate the feasibility and workflow of implementing an add-on antidepressant follow-up telehealth service.

Methods: This is a single-center, prospective quality improvement pilot project, evaluating patients referred by a primary care provider to a pharmacist-led antidepressant follow-up service between November 2021 through April 2022. Patients, aged 18 years and older, started on a new antidepressant medication for depression and/or anxiety were contacted for follow-up at weeks 2, 4, 8 and 12, to assess adherence and change in depression symptoms, and implement any necessary pharmacy interventions. Baseline characteristics and outcomes data were collected into a database alongside documentation of each visit in the electronic health record. Descriptive aspects of the add-on service, such as barriers to implementation, were also compiled to measure ongoing feasibility.

Results: A total of 13 patients from 4 providers were referred to the service during the 3-month enrollment period, with a mean age of 58.1 ± 17.8, and 84.6% female. Eight patients were initiated on sertraline, two on fluoxetine, and one each on bupropion XL, citalopram and escitalopram. Initial PHQ-9 score was 12.0 ± 3.7, decreasing to 7.5 ± 4.4 at last contact with pharmacist, with 44.4% of patients seen at least 3 times achieving a response, and 22.2% achieving a partial response. Interventions made by pharmacist were as follows: adherence counseling (9), dose increase (8), side effect management (2), adjustment of administration time (2), recommended provider follow-up (2), prescription refill (2), assistance with another medication (2), and dose decrease (1). In terms of implementation feasibility, although time spent talking to patients was only 9.5 ±7.0 minutes per visit, a major workflow barrier was
patient accessibility, with an average of 1.5 attempts to reach patients for each visit, and over half of patients being lost to follow-up before 12 weeks.

Conclusions: This project demonstrated the value of a pharmacist-led follow-up telehealth service in terms of both efficacy and safety related to antidepressant initiation, and identified future adjustments to workflow in order to promote continued growth of this new service.
Clinical impact of pharmacist management of diabetes at an outpatient endocrine clinic

Authors: A. Ward, S. Singh, J. Kwok

Title: Clinical impact of pharmacist management of diabetes at an outpatient endocrine clinic

Objectives: Diabetes mellitus is one of the leading causes of morbidity and mortality in the United States. Current evidence and guidelines reflect that close monitoring and achieving various glycemic targets, such as hemoglobin A1C and fasting blood glucose, have positive effects on patient outcomes. The American Diabetes Association currently states that collaborative, multidisciplinary teams are imperative to facilitate a patient's management of diabetes. The objective of this review is to evaluate the impact a pharmacist can have on glycemic goals in an outpatient setting.

Methods: A retrospective chart review will be conducted using electronic medical records for all non-pregnant adults managed by a pharmacist at an outpatient endocrine clinic from December 2020 to December 2021. The following data will be collected: age, gender, race, weight/BMI, medications, type of diabetes, and duration of diagnosis. Additionally, data regarding patient's time enrolled in the clinic, number of follow-up visits with a pharmacist, and quantity and type of interventions made by a pharmacist will be collected. Hemoglobin A1C, fasting blood glucose, presence of microalbuminuria, and hypoglycemic episodes, before and after pharmacist intervention will be assessed. The primary outcomes of this study will be change in A1C from baseline and the proportion of patients achieving A1C goal after pharmacist intervention. The secondary outcomes will be the percentage of patients achieving goal fasting blood glucose, number of patients achieving A1C < 9%, frequency of hypoglycemia, and the proportion of patients with microalbuminuria on either an angiotensin-converting enzyme inhibitor or an angiotensin II receptor blocker.

Results: A total of 87 patients were included in this study. Mean baseline A1C was 9.3% before pharmacist intervention, and decreased to 8.3% after pharmacist intervention. Patients were managed by the pharmacist over an average of 2.6 months, and had a mean of 3.2 visits; 25.2% of patients had an initial pharmacist visit but were lost to follow-up. A1C decreased by 1.0% (9.6% decrease) from baseline, and 26.4% of patients met their A1C goal after pharmacist intervention. Thirty-six patients had a baseline A1C ≥ 9% and 47.2% of those patients achieved an A1C < 9% after the last pharmacist visit.

Conclusions: Our study demonstrates that patients managed by a pharmacist at an outpatient endocrinology clinic were able to reach their respective A1C goal at a comparable rate to the
national average. The decrease in A1C matches other studies showing a pharmacist's impact in A1C scores when managing patients at an outpatient endocrinology office. Limitations in this study include short duration of follow-up, small sample size, non-compliance with medications or follow-ups, and retrospective study design.
Authors: Steven Yost PharmD, Kirsten Held PharmD, BCPS, Stephanie Thomas PharmD, BCPS, CDCES

Title: Evaluation of Pharmacist-Driven Diabetes Management in Lowering A1C Values

Objectives: Diabetes is a common disease state that affects around 34.2 million Americans each year and is known as the seventh leading cause of death in the United States. One important way to track a patient's progression with diabetes is to compare hemoglobin A1C values over time to see if diabetes management interventions have been beneficial in controlling blood glucose values. Evidence shows pharmacist intervention in diabetes management contributes to patients with diabetes achieving and sustaining lower daily blood glucose values with subsequent lower A1C values. By comparing the changes in A1C values in patients with and without pharmacist intervention, the value of pharmacist driven care can be properly evaluated.

Methods: This project is designed to provide the results of a retrospective data extraction and will include a comparison of two independent groups. The defined study period for this project is October of 2019 to March of 2022. Patients in this study were included if they are part of the Clinically Integrated Network (CIN). Included patients must have an initial A1C value ≥ 8% and have had at least one repeat A1C value collected at least 3 months after the initial value within the defined study period. Additionally, data was only extracted for patients who are 18 years of age or older and have a diagnosis of type 2 diabetes. The change in A1C values from a group of patients who received diabetes management via pharmacist intervention is being compared to the change in A1C values of a group of patients who did not receive diabetes management via pharmacist intervention.

Results: Results from the comparison of the changed hemoglobin A1C values from patients who received pharmacist driven care versus those diabetic patients who did not receive pharmacist driven care will be presented.

Conclusions: The assumption of this project is that those uncontrolled diabetic patients who received pharmacist driven diabetic management will have a more profound reduction in A1C values when compared to those patients who did not experience diabetes management with a pharmacist.
Evaluation of safety and effectiveness of direct oral anticoagulants following surgical bioprosthetic valve replacement

**Objectives:** Antithrombotic therapy with a vitamin K antagonist (VKA) such as warfarin for 3-6 months after surgical bioprosthetic valve replacement is recommended by the current ACC/AHA guidelines to reduce the incidence of thrombotic events until the valve has fully endothelialized. Direct oral anticoagulants (DOACs) can be considered 3 months after valve replacement in patients who have concomitant atrial fibrillation. However, DOAC use in the early post-operative period (less than 3 months following implantation) remains controversial due to the limited body of evidence investigating the use of these agents in this patient population. The purpose of this study was to evaluate clinical outcomes in patients initiated on DOACs compared to warfarin in the early post-operative period following surgical bioprosthetic valve replacement.

**Methods:** This was a retrospective cohort study of adult patients who received a surgical bioprosthetic valve replacement at a community teaching hospital between July 2019-October 2021 and were discharged on either a DOAC or warfarin. Patients were excluded if they had received a mechanical or transcatheter valve replacement or if the oral anticoagulant was switched or discontinued within the follow-up period (3 months from valve replacement). The primary effectiveness outcome was incidence of thrombotic events within 30 days of valve replacement. The primary safety outcome was incidence of major bleeding within 30 days of valve replacement. Secondary outcomes included hospital and intensive care unit lengths of stay, thrombotic events within 90 days, and various bleeding outcomes within 30 and 90 days.

**Results:** A total of 200 patients were included in the study; 51 patients received warfarin and 149 received a DOAC (apixaban, n=135; rivaroxaban, n=14). Two patients experienced thrombotic events within 30 days, 1 in the warfarin group and 1 in the DOAC group (2.0% vs 0.7%; p=0.446). Four patients experienced major bleeding events within 30 days, 3 in the warfarin group and 1 in the DOAC group (5.9% vs 0.7%; p=0.052). Complete findings will be presented at the 2022 Eastern States Residency Conference.

**Conclusions:** There were no statistically significant differences seen between groups for the co-primary outcomes of major bleeding or thrombotic events within 30 days post-surgical
bioprosthetic valve replacement. This is the largest retrospective observational cohort study investigating the use of DOACs compared to warfarin following surgical bioprosthetic valve replacement in the early post-operative period. Large randomized controlled trials are needed to further evaluate the safety and effectiveness of DOACs in this population.
The Impact of Bedside Medication Delivery Before Emergency Department Discharge on Antibiotic Compliance

Geisinger Wyoming Valley Medical Center instituted a ‘Meds to Beds’ program in the emergency department (ED) in the fall of 2020. This program allows patients being discharged directly from the ED to receive their full prescription pre-packaged with instructions prior to leaving the emergency department. For antibiotics, this intervention could be crucial to patient adherence and the overall efficacy of the treatment course, with a reduced risk of the condition worsening or the individual being re-admitted. However, the true impact of this program has not truly been studied anywhere in the ED arena. The primary objective of our study was to retrospectively analyze the adherence of patients receiving antibiotics via the Meds to Beds program.

Methods: This study was conducted as a comparison analysis to patients receiving outpatient prescriptions prior to the implementation of Meds to Beds. We identified patients who received and failed to obtain their outpatient antibiotic prescribed from the GWV ED between April 2020 and September 2020 via collection of claims data. This was compared to the number of patients who received Meds to Beds antibiotics prior to discharge from the GWV ED from November 2020 to May of 2021. We then assessed re-admission rates due to the same diagnosis or worsening condition from the initial ED visit where the outpatient antibiotic was prescribed. Infections and antibiotic prescriptions were identified by ICD-10 and medication codes.

Results: A total of 5069 infection-related admissions to the Geisinger Wyoming Valley Emergency Department were identified during the study period. 2343 patients were prescribed an antibiotic for outpatient pick-up, of which 2097 patients filled their prescription. Comparatively, 678 patients received an antibiotic for outpatient use prior to discharge via Meds to Beds (p < 0.0001). Patients who picked up their prescription were less likely to be re-admitted for an infection within 30 days (p < 0.05). However, Meds to Beds participants were even less likely to be re-admitted within 30 days (p < 0.05).

Conclusions: Based on prescription fill rates and 30-day readmissions, patients who received antibiotics prior to discharge from the Geisinger Wyoming Valley Emergency Department via
Meds to Beds had better compliance to their antibiotic regimens than patients who were given a script to be filled outpatient.
Conference Abstracts
May 16-18, 2022

Presenter Name: Al Zaria, Mohsen
Organization: Brigham and Women's Hospital, Boston, MA
Category: Cardiovascular/Critical Care
Day | Session | Room | Time: Tuesday | 3 | Crystal B | 2:00:00 PM

Authors: Mohsen H. Al Zaria, PharmD, Leo F. Buckley, PharmD, Gregory Piazza, MD, MS; Behnood Bikdeli, MD, Samuel Goldhaber MD, John Fanikos, RPh, MBA

Title: Direct Oral Anti-Coagulant Drug Interactions in Hospitalized Patients

Objectives: Moderate-strong CYP3A4 or Pgp inhibitors and inducers alter direct oral anticoagulant (DOAC) pharmacokinetics. Whether the presence of a DOAC drug-drug interaction (DDI) prompts changes in management remains unknown.

Methods: We identified all hospitalized patients at our institution who were admitted with a clinically relevant DOAC DDI from 01/2021 to 06/2021. Clinically relevant DOAC DDIs were defined as those listed in the prescribing information or FDA CYP3A4/Pgp inhibitors clinical indexes. We assessed the prevalence of DOAC DDIs and categorized their management as: drug stopped; drug held; dose adjusted; other. We ascertained the number of DOAC DDIs that prompted an automated prescribing alert in our electronic health record (EHR).

Results: Among 3,725 hospitalizations with a DOAC admission order, 197 (5%) had a clinically relevant DOAC DDI. The DOAC and the interacting drug were continued unchanged at discharge for 124 (63%) hospitalizations. The most frequent adjustments were stopping the interacting drug (73%) and stopping the DOAC (15%) (Figure). Only 7 (4%) of DOAC DDIs prompted an EHR alert.

Conclusions: Clinically relevant DDIs with DOACs occur infrequently among hospitalized patients and usually are managed without stopping the DOAC. The clinical impact of such DDIs and subsequent adjustments on thrombotic and hemorrhagic outcomes requires further investigation.
**Conference Abstracts**  
May 16-18, 2022

**Presenter Name:** Alexander, Scott  
**Organization:** Geisinger Lewistown Hospital  
**Category:** Cardiovascular/Critical Care  
**Day | Session | Room | Time:** Monday | 2 | Empire A | 4:15:00 PM

**Authors:** Scott Alexander, Jarret LeBeau, Amanda Popko, Kelly Kempa

**Title:** Difference in Venous Thromboembolism Rate of non-Critically Ill COVID-19 Patients Based on Demographic Risk Factors

**Objectives:** General VTE risks are well defined and include advanced age, race, obesity, prior VTE, and gender. Building off these factors, we can further explore and define risk factors for VTE in non-ICU COVID-19 patients. This case-control study seeks to investigate differences in VTE rates in non-ICU COVID-19 patients based on demographic risk factors of age, sex, race, BMI, prior VTE status, smoking status and COVID-19 vaccination status

**Methods:** A chart review of non-ICU inpatients and outpatients with COVID 19 infection will be conducted to evaluate differences in the rate of VTE based on demographic factors. Inclusion criteria include: Age ≥ 18 years old, positive COVID-19 diagnosis in inpatient or outpatient setting, and DVT or PE.

**Results:** In progress. We will be looking to compare rates of VTE in the demographic groups described above

**Conclusions:** In progress. We suspect that there will be statistically significant differences in the VTE rates.
Authors: Lama Alfehaid, George Abdallah, Sonia Kothari, Kelly Nguyen

Title: Evaluation of Anti-Xa-Guided versus aPTT-Guided Management of Intravenous Unfractionated Heparin in Patients Requiring a Durable Ventricular Assist Device

Objectives: To compare the efficacy and safety of anti-Xa-guided vs. aPTT-guided management of intravenous (IV) unfractionated heparin (UFH) in patients requiring a ventricular assist device (VAD)

Methods: This was a retrospective observational study that included adult patients with an implanted durable VAD (HeartMate II, HeartMate 3, or HeartWare HVAD) requiring anticoagulation with either aPTT UFH guided management from May 2019 to May 2020 or anti-Xa UFH guided management from May 2021 to December 2021. Patients who were on temporary mechanical circulatory support, anticoagulation therapy for less than 24 hours, or had contraindications to UFH therapy were excluded. The primary outcome was the median time to goal anticoagulation from initiation of IV UFH, defined as 2 consecutive aPTT or anti-Xa values within the desired range. Secondary outcomes included the percentage of time within the therapeutic range, the incidence of thromboembolic complications, rates of bleeding, and patient disposition. Continuous baseline data will be analyzed by the independent student t-test and nominal data will be analyzed by chi-square or Fisher's Exact test. All statistical analyses will be performed by a consultant statistician.

Results: The median time to goal anticoagulation from initiation of IV UFH and the percentage of time within the therapeutic range will be compared between anti-Xa-guided and aPTT-guided UFH management in patients who have had a durable VAD implanted. Additionally, the incidence of thromboembolic complications, rates of bleeding will be reported, and the results will be presented.

Conclusions: It is anticipated that this project will identify the most effective method for the monitoring of anticoagulation therapy in patients with a durable VAD implanted.
Objectives: Recent international consensus guidelines recommend non-benzodiazepine sedatives, such as dexmedetomidine, over benzodiazepines in critically ill, mechanically ventilated adult patients. Obese patients receiving weight-based dexmedetomidine infusions may have higher overall drug exposure, which may result in an increased incidence of adverse drug events (ADE), notably hypotension and bradycardia. This study will evaluate dexmedetomidine-associated hypotension and bradycardia in obese patients compared to non-obese patients.

Methods: Our study was a retrospective cohort study conducted at a 793-bed tertiary care academic medical center. Adult patients admitted to any ICU between January 1, 2018, and December 31, 2019 who received continuous infusion dexmedetomidine for at least 6 hours were included. Patients with a systolic blood pressure (SBP) less than 90 mmHg or heart rate (HR) less than 50 bpm without vasopressor therapy were excluded. Patients were assigned to obese group (patients with a body mass index (BMI) of greater than or equal to 30 kg/m2) or non-obese group (patients with BMI of less than 30 kg/m2). The primary composite endpoint was incidence of hypotensive or bradycardic events between groups. Secondary endpoints were hypotensive events and bradycardic events in obese and non-obese patients. Univariate analysis was performed on baseline characteristics to evaluate the association of individual risk factors for bradycardic and hypotensive events. A variable with a P <0.05 was considered statistically significant, and was used in the multivariate analysis. In addition, the Sequential Organ Failure Assessment Score and BMI were added to the multivariate analysis.

Results: A total of 90 patients were enrolled in this study. Each group had 45 patients. Univariate and multivariate logistic regression analysis of the primary composite endpoint showed no difference in risk of developing the composite endpoint between the two groups (OR 2.6, 95% CI (0.52 â€“ 13.90), p = 0.24). The only risk factor that was associated with the primary endpoint using the univariate analysis was the maximum rate of dexmedetomidine infusion (OR 3.58, 95% CI (1.05 â€“ 12.21), p 0.04). The analysis of the secondary endpoints showed no difference in hypotension or bradycardia between the obese patients and non-obese
patients with OR 3.37, 95% CI (0.77 - 14.61), p 0.11, and OR 0.67, 95% CI (0.13 - 3.49), p 0.64, respectively.

**Conclusions:** The results of this study showed no difference in a composite endpoint of hypotension and bradycardia, and either component of the composite endpoint between obese and non-obese patients. Larger studies may be needed to provide more definite results.
**Title:** Comparison of early versus late initiation of the combination of vasopressin plus corticosteroids in patients with septic shock

**Objectives:** The Surviving Sepsis Campaign: International Guidelines for Management of Sepsis and Septic Shock 2021 provide weak recommendations with a moderate quality of evidence to add vasopressin to patients with septic shock who have inadequate mean arterial pressures despite norepinephrine, and to add corticosteroids if the need for vasopressors persists. Vasopressin and corticosteroids, both individually and as a combination, have been shown to improve outcomes in patients with septic shock. While early administration of the individual agents appears to be more effective, very little exists to address the impact of the timing of the combination. This retrospective analysis will evaluate the impact of early initiation of hydrocortisone (HC) and vasopressin (VP) within 12 hours of septic shock onset compared to late initiation after 12 hours of septic shock onset.

**Methods:** This is a single-center, retrospective, observational study, being conducted at a 793-bed tertiary academic medical center. This study has been approved by Mass General Brigham Institutional Review Board (protocol # 2021P002540). Data are being collected from system-generated reports, which were used to identify septic shock patients who were admitted to the coronary care unit or medical intensive care unit and received both vasopressin and hydrocortisone from 01/01/2017 to 12/31/2019. Participants will be divided into the "early" group if both VP and HC were initiated within 12 hours of the onset of septic shock or into the "late" group if VP and HC or either one was initiated after 12 hours of the onset of septic shock. Patients will be excluded if they are < 18 years old, transferred from an outside facility after initiation of vasopressors, or receiving high-dose corticosteroid therapy defined as ≥ 400 mg of HC equivalent per day. Baseline characteristics and analyses of primary and secondary endpoints will be completed using Student's t-test for continuous data and Pearson's chi-squared test or Fisher exact test for categorical data.

**Results:** The major endpoint of this study will be time to vasopressor discontinuation defined as vasopressor infusion discontinuation for at least 24 hours. Other endpoints will be ICU and in-hospital mortality, Sequential Organ Failure Assessment (SOFA) score trends (at 24, 48, 72 hours), vasopressor-free days, hospital and ICU length of stay, the need for renal replacement
therapy, and duration of mechanical ventilation. All endpoints will be collected, and results will be presented.

**Conclusions:** It is anticipated that this study will describe the impact of early versus late initiation of the combination of VP and HC in patients with septic shock.
Effect of adjunct inhaled epoprostenol on improving oxygenation in critically ill patients with acute respiratory distress syndrome associated with coronavirus disease 2019 (COVID-19) infection

Objectives: Acute Respiratory Distress Syndrome (ARDS) is a clinical syndrome of severe hypoxemia and diffuse pulmonary infiltrates causing respiratory failure. There is limited data regarding the role of inhaled epoprostenol in patients with ARDS associated with COVID-19. The objective of this study was to evaluate the continued efficacy of extended therapy with inhaled epoprostenol in critically ill patients with ARDS associated with COVID-19 infection.

Methods: This was a retrospective, single center, observational study including adult critically ill patients who received inhaled epoprostenol for ARDS associated with COVID-19 infection. Patients were excluded if inhaled epoprostenol was administered for less than 24 hours, initiated prior to transfer to our hospital, and if patients required Extracorporeal Membrane Oxygenation or did not have baseline arterial blood gases. Patients were considered responders to therapy if they had at least 10% improvement in PaO2/FiO2 ratio within 24 hours of epoprostenol initiation. The primary outcome was the percentage of time patients remained responders after inhaled epoprostenol initiation. Secondary outcomes included ICU length of stay, and in-hospital mortality.

Results: Of the 32 patients included in our study, 20 patients (62.5%) were considered responders. The median percentage of time patients remained responders after 24 hours of inhaled epoprostenol initiation was 19%. The average ICU length of stay was 17 days for responders and 16 days for non-responders. Finally, in-hospital mortality was 95% for responders and 92% for non-responders. Full data analysis and interpretation will be presented at the conference.

Conclusions: We found that a high percentage of patients with ARDS associated with COVID-19 infection who received inhaled epoprostenol responded to treatment within 24 hours of initiation. However, the effect of treatment was not permanent despite the continued use of inhaled epoprostenol. No difference was seen in secondary outcomes of length of stay or mortality between the groups.
Evaluating the impact of a pharmacy-led initiative to incorporate sodium-glucose cotransporter-2 inhibitors in the prescribing protocol for patients with heart failure with reduced ejection fraction

**Title:** Evaluating the impact of a pharmacy-led initiative to incorporate sodium-glucose cotransporter-2 inhibitors in the prescribing protocol for patients with heart failure with reduced ejection fraction

**Objectives:** Recent landmark trials evaluating use of sodium-glucose cotransporter-2 (SGLT2) inhibitors, such as dapagliflozin and empagliflozin, in patients with heart failure (HF) have shown tremendous benefits, including symptom and quality of life improvement, lowering hospitalization risk, slowing renal disease progression, and reduction in cardiovascular mortality. The most recent HF treatment guidelines recommend SGLT2 inhibitor initiation in select patients. Empagliflozin is now approved for both heart failure with reduced and preserved ejection fraction. This research project is designed to identify current barriers to prescribing, devise a decision and patient selection algorithm, and create an infographic to facilitate prescribing practices and provide education to prescribers. The primary outcome was to compare SGLT2 inhibitor use before and after implementation of aforementioned interventions to assess the impact on acceptance of updated guidelines.

**Methods:** Patients admitted into the hospital with HF are initiated on the heart failure order set which includes a prescribing protocol. The pharmacy team has access to this list of patients and can appropriately screen patients who would benefit from education and counseling regarding HF medical care. Responsibility of the pharmacists include comprehensive review of the outpatient medication list, assessment of appropriateness based on patient specific factors, and evaluation of current status. Upon review, pharmacists will screen eligible candidates for empagliflozin, complete a price check, and provide a recommendation for initiation to providers. Data evaluated to determine eligibility status includes, but is not limited to: ejection fraction &ge; 40%; current guideline directed medical therapy (GDMT); markers of kidney function; patient age; blood glucose and A1c; adverse events of interest: symptoms of volume depletion, renal events, urinary or genital infections; and exclusion criterion such as dialysis.

**Results:** Pre and post intervention utilization rates of empagliflozin, total number of patients found to be eligible, number of interventions made, and recommendations accepted will be recorded and results will be presented.

**Conclusions:** In advocating for best practice supported by current guidelines, this research project is anticipated to reveal the indispensable role of a pharmacist in screening for eligible
candidates for empagliflozin to provide recommendations as appropriate, and ultimately to increase adherence with evidence-based guidelines in the treatment of heart failure with reduced ejection fraction (HFrEF).
Impact of clevidipine versus nicardipine on time in range when lowering blood pressure

Within emergency and critical care medicine, there are a variety of emergent conditions that present with dangerously elevated blood pressures and require rapid blood pressure control. Two intravenous medications commonly used as first-line therapy for rapid blood pressure control are nicardipine and clevidipine, both of which are available as titratable drips. The major difference between them is their pharmacokinetic profiles, which could have an impact on how quickly and accurately blood pressure control can be attained. The objective of this study was to evaluate efficacy and safety outcomes associated with current use of these medications in a hospital system in order to provide insight into whether one agent should be favored in practice.

Methods: This study was a multi-center, retrospective chart review conducted within the seven acute-care hospitals that make up Hartford Healthcare. Inclusion criteria encompassed patients between the ages of 18 and 89 years old treated at an acute care hospital with nicardipine or clevidipine for emergent blood pressure control between June 1, 2020 and June 30, 2021. Patients were matched in a one-to-one fashion based on indication for blood pressure control and similar pre-intervention blood pressure. The exclusion criteria were as follows: patients who were pregnant or experiencing eclampsia post-partum, transferred between facilities within 24 hours of infusion initiation or to an external acute care facility prior to discharge, discharged or deceased within 24 hours of drip initiation, did not have a documented goal blood pressure, or otherwise eligible patients who did not have a match based on indication or pre-intervention blood pressure.

Results: The primary outcome that will be presented is the percent of time within target blood pressure range. The secondary outcomes that will be presented are time to target blood pressure, time to oral antihypertensive initiation, incidence of hypotension during infusion, and use of rescue medication during infusion.

Conclusions: Conclusions are still in progress.
Assessing subclinical mineralocorticoid deficiency in patients treated with dexamethasone (ASMaD Trial): A Pilot Study

Authors: Charles Baddour, BSPS, PharmD; Jennifer Chaffin, PharmD, BCPS, BCCCP

Title: Assessing subclinical mineralocorticoid deficiency in patients treated with dexamethasone (ASMaD Trial): A Pilot Study

Objectives: To compare the biochemical markers associated with mineralocorticoid homeostasis in patients receiving two different doses of dexamethasone, as well as no corticosteroids

Methods: This was a retrospective, case-control study conducted in the cardiopulmonary ICU (CPICU) and cardiopulmonary step-down unit at a tertiary academic medical center in Charleston, West Virginia. Patients were identified using the CAMC COVID-19 database. Patients were included if they were 18 years and older, positive for COVID-19 via a viral respiratory panel, and admitted to one of the two aforementioned units. Patients were analyzed if they received one of three approved corticosteroid regimens: no steroids for 10 days, dexamethasone 6 mg daily for 10 days ("low-dose dexamethasone"), or dexamethasone 20 mg for 5 days followed by 10 mg for 5 days ("high-dose dexamethasone"). Patients were excluded if they had a history of chronic steroid use, were treated with an aldosterone antagonist in the 10-day treatment period, were pregnant, or were discharged sooner than 10 days. Statistical tests were carried out using three 2-way analyses, comparing no steroids

Results: Eighty-four patients were enrolled. Eight patients received no steroids, 34 patients received low-dose dexamethasone, and 42 patients received high-dose dexamethasone. Baseline characteristics were similar, however, the baseline SOFA score was significantly higher in the high-dose group (3.5±1.6 vs 3.5±1.99 vs 4.90±2.88), primarily due to the pulmonary sub-score. There was no significant difference in patients who received potassium-depleting agents (62.5% vs 70.6% vs. 78.6%), potassium support (50% vs 50% vs 50%) or fluid support (50% vs. 20.6% vs 28.6%). Regarding the change in sodium level from day 0 to day 10, there was no difference in no steroids vs. low-dose dexamethasone (-2.88±9.01 vs -0.74±6.80, p=0.4561) or no steroids vs. high-dose dexamethasone (-2.88±9.01 vs 2.71±7.59, p=0.07). There was a significant difference among low-dose dexamethasone and high-dose dexamethasone (-0.74±6.80 vs 2.71±7.59, p=0.0427). There was no significant difference in potassium change from day 0 to day 10: no steroids vs. low-dose (0.28±0.90 vs 0.26±0.60, p=0.9688), no steroids vs. high-dose (0.28±0.90 vs 0.20±0.99, p=0.8493).
**Conclusions:** The use of neither low-dose dexamethasone nor high-dose dexamethasone was associated with significant biochemical marker changes associated with mineralocorticoid deficiency or suppression. These findings fail to support the physiologic theory that pure glucocorticoid agonism would result in mineralocorticoid suppression. Given the non-interventional nature of this study, as well as the small sample size, this study does not provide conclusive evidence regarding the theory.
Effect of the COVID-19 pandemic on ICU Liberation Bundle adherence

Objective:
Comprehensive supportive intensive care unit (ICU) care is recommended by current Society of Critical Care Medicine (SCCM) guidance to reduce delirium, duration of mechanical ventilation, and possibly increase survival. The ‘ICU Liberation Bundle’, includes six core supportive care elements focusing on pain, sedation and delirium management, ventilator liberation, early mobility, and family involvement. From the start of the COVID-19 pandemic, significant deviations were made to providing standard ICU care due to limited resources and efforts to minimize exposure to healthcare personnel. Impact of the COVID-19 pandemic on bundle adherence and the clinical implications on patient outcomes have yet to be elucidated. The aim of this study was to compare bundle adherence prior to and during the height of the COVID-19 pandemic then secondarily assess the impact adherence variation had on clinical outcomes.

Methods:
This single-center retrospective cohort study examined adult medical ICU patients who required mechanical ventilation (MV) for ≥48 hours with an ICU stay ≥7 days following start of MV. Exclusion criteria included comfort measures ≤48 hours of ICU admission, admitted from a long-term care facility, or transferred from another hospital. Patients were separated into three cohorts based on time of ICU admission and COVID-19 status (Pre-pandemic: April 2019-March 2020; Pandemic COVID-19 negative [COV-neg] and Pandemic COVID-19 positive [COV-pos]: April 2020-March 2021). An assessment of daily bundle eligibility and adherence for its six components was performed for the first 7 days after intubation. The primary outcomes were average daily adherence over 7 days and days of complete adherence. Secondary outcomes included length of stay, duration of MV, mortality, days alive and free of MV and delirium, and 30-day readmissions. Categorical data was compared using the Fisher's exact test and continuous data using Kruskal-Wallis and Mann Whitney U tests.

Results:
A total of 410 patients were identified as eligible for inclusion. A random sample of 170 were screened for inclusion of which 68 were excluded. Another random sample of 67 were analyzed (pre-pandemic n=21; COV-neg n=21; COV-pos n=25). Baseline demographics were similar. Median daily adherence was different across all three groups (pre-pandemic 68.6% [65-
72.8% vs COV-neg 51.4% [45-60.7] vs COV-pos 32.6% [22.6-47.6]; p <0.001) and when comparing the pre-pandemic cohort to both the COV-neg (p<0.001) and COV-pos cohorts (p<0.001) individually. Median number of days with complete adherence (pre-pandemic 1 [0-1] vs COV-neg 0 [0-0] vs COV-pos 0 [0-0]; p <0.001) as well as number of patients with complete adherence (pre-pandemic 11 (78.6%) vs COV-neg 2 (14.3%) vs COV-pos 1 (7.1%)) were also significantly different. Median duration of MV (Pre-pandemic: 6.3 [5.6-9] vs COV-neg 8.9 [7.6-14] vs COV-pos 11.6 [8.4-21]; p=0.01) and days alive without MV (Pre-pandemic: 23 [21-24] vs COV-neg 20 [15-22] vs COV-pos 18 [7-21]; p=0.015) were different across cohorts, but there was no difference in any other outcomes.

**Conclusions:** ICU liberation bundle adherence was significantly reduced during the COVID-19 pandemic though this did not correlate to a meaningful difference in several clinical outcomes other than time on the ventilator.
Does dexmedetomidine reduce anxiolytic use in non-intubated patients?

Objectives: Delirium and agitation in the ICU are often the result of overprescribing antipsychotics or benzodiazepines. An alternative sedating medication, dexmedetomidine, has been found to reduce the incidence of delirium and agitation in non-intubated patients while providing adequate light sedation. The purpose of this analysis is to assess the use of dexmedetomidine in reducing anxiolytic requirements in non-intubated patients.

Methods: This is a multi-center, retrospective analysis of non-intubated adult patients at a community health system who received dexmedetomidine while in the ICU. Patients were excluded from analysis if they had known hypersensitivity to dexmedetomidine or any component of the formulation, were pregnant, had history of severe dementia or acute neurologic injury, or were intubated within 48 hours of dexmedetomidine initiation. The primary outcome was the number of anxiolytic administrations 48 hours prior to start of dexmedetomidine infusion vs. number of anxiolytic administrations during infusion. Data was collected for the following anxiolytics: haloperidol, lorazepam, diazepam, midazolam, quetiapine, phenobarbital, hydroxyzine, and diphenhydramine. Secondary outcomes include excess sedation (defined as RASS < -1), bradycardia (defined as HR < 60), hypotension (defined as SBP < 90), ICU length of stay, hospital length of stay, and in-hospital mortality.

Results: Sixty patients met inclusion criteria and were included in the analysis. The average number of anxiolytic administrations was reduced from 1.72 to 0.97 after dexmedetomidine initiation (P=0.003). With regards to safety, there were no bradycardic events and there was only one hypotensive event during dexmedetomidine infusion. The median ICU length of stay was 8 days and the median hospital length of stay was 9 days. In-hospital mortality was 5/60 (8.3%), with three deaths being attributed to COVID-19.

Conclusions: The use of dexmedetomidine in non-intubated ICU patients reduced the use of traditional anxiolytics. Dexmedetomidine was well-tolerated in this patient population at doses up to 0.7 mcg/kg/hr. Dexmedetomidine should be considered in non-intubated patients with significant anxiolytic requirements.
**Conference Abstracts**

May 16-18, 2022

**Presenter Name:** Berry, Kayla  
**Organization:** Johns Hopkins Medicine  
**Category:** Cardiovascular/Critical Care  
**Day | Session | Room | Time:** Monday | 2 | Crystal B | 4:30:00 PM

**Authors:** Kayla J. Berry, Jessica Chasler, Jessica Crow, Catherine Kiruthi, John Lindsley, Rakhi Naik, Michael Streiff, Jennifer Yui, Kathryn E. Dane

**Title:** Evaluation of Bivalirudin Weight-Based Dosing in Obese Patients

**Objectives:** The direct thrombin inhibitor bivalirudin is typically dosed based on actual body weight; however, it is unclear in obese patients whether this is the most appropriate dosing weight to achieve a therapeutic activated partial thromboplastin time (aPTT). The purpose of this study is to determine whether differences exist in weight-based bivalirudin dose requirements to achieve a therapeutic aPTT between obese and non-obese patients.

**Methods:** This multi-center retrospective cohort study conducted at two academic medical centers will evaluate adult hospitalized patients receiving bivalirudin from July 1, 2016- November 1, 2021. Patients will be excluded if they meet any of the following criteria: initial bivalirudin administration occurred in a procedural area; bivalirudin administered via the intradermal route; extracorporeal membrane oxygenation during admission; below standard target aPTT range; aPTT value not obtained during bivalirudin infusion; missing baseline aPTT value; baseline aPTT above 40 seconds; or patients without a documented height, weight, or serum creatinine at the time of bivalirudin initiation.

**Results:** Results to follow. The bivalirudin dose resulting in the first therapeutic aPTT, time to first therapeutic aPTT on bivalirudin, and number of dose titrations required to achieve the first therapeutic aPTT will be compared between obese patients and non-obese patients stratified by renal function. Additionally, the percentage of patients with first aPTT values as well as percentage of all aPTT values obtained on bivalirudin that were therapeutic, subtherapeutic, and supratherapeutic will be reported.

**Conclusions:** It is anticipated that the results from this study will determine the optimal bivalirudin dosing strategy for obese patients.
Utilization of phenobarbital loading dose compared to symptom-triggered dosing for severe alcohol withdrawal syndrome in a community hospital intensive care unit

**Objective:** The American Society of Addiction Medicine guidelines recommend phenobarbital monotherapy for alcohol withdrawal as an alternative for patients with a contraindication to benzodiazepines or as an adjunct in refractory cases. Recent studies have shown that phenobarbital monotherapy provides a more predictable response. Additionally, its long half-life allows for precise dosing and an auto-taper upon therapy completion. The institutional intensive care unit (ICU) severe alcohol withdrawal protocol guides providers to select a loading dose of phenobarbital (PB) 10 mg/kg and/or a symptom-triggered dose of PB 130 mg or 65 mg given every 15 minutes (maximum of 10 doses or 30 mg/kg). Doses are given if the Richmond Agitation Sedation Scale (RASS) score > 0. The purpose of this study was to determine if a PB loading dose of 10 mg/kg decreased time to initial control of severe alcohol withdrawal symptoms compared to those who only received symptom-triggered dosing.

**Methods:** This was a single-center, retrospective chart review of adult patients admitted to the ICU with a diagnosis of severe alcohol withdrawal or delirium tremens from July 1, 2020, to June 30, 2021. The primary outcome was time to initial control of severe alcohol withdrawal symptoms based on a RASS score of < 0. Secondary outcomes included length of stay (LOS), rate of mechanical ventilation, cumulative PB dose(s) prior to achievement of RASS goal, and percentage of patients requiring adjunctive medications for symptom control.

**Results:** Fifty-one admissions were identified during the study period and 24 admissions met inclusion criteria. Nineteen of the admissions utilized the PB 10 mg/kg loading dose and five admissions utilized symptom-triggered loading doses. The average age of the patients was 47 years; 87.5% (n=21) patients were male. Patients achieved the primary outcome in 6.7 hours in the PB 10 mg/kg group versus 11.5 hours in the symptom-triggered group, a difference of 4.8 hours. The 10 mg/kg group received 11.93 mg/kg of PB prior to achievement of the RASS goal compared to 8.78 mg/kg in the symptom-triggered group. Of note, patients in the symptom-triggered group received 6 doses versus 2.8 doses in the 10 mg/kg group prior to achievement of RASS goal. The average ICU LOS was 3.9 days in the 10 mg/kg group and 2.7 days in the symptom-triggered group. The average hospital LOS was 10 days in the 10 mg/kg group and
8.5 days in symptom-triggered group. Patients required adjunct medications for symptom-control in both groups.

**Conclusions:** The results support the use of PB 10 mg/kg loading dose due to its faster onset and fewer doses needed to achieve appropriate sedation in severe alcohol withdrawal patients. Further investigation in larger populations will identify which patients require larger loading doses.
Objective: Patients undergoing neuroendovascular procedures have a significant risk of developing thromboembolic complications peri-operatively requiring the use of antiplatelet therapy including aspirin, P2Y12 inhibitors, and glycoprotein IIb/IIIa inhibitors. Cangrelor, an intravenous P2Y12 inhibitor, was approved in 2015 as an adjunct to percutaneous coronary intervention for cardiac patients. The pharmacokinetic properties of cangrelor provide a promising benefit for patients undergoing acute neuroendovascular procedures, however there is limited available data due to the lack of experience with cangrelor use in this patient population. The purpose of this single center, retrospective study is to investigate the safety and efficacy of cangrelor vs eptifibatide in patients undergoing neuroendovascular procedures.

Methods: A retrospective chart review was performed that identified all neuroendovascular patients admitted to UMass Memorial Medical Center on eptifibatide from October 1, 2019 to October 1, 2020 and cangrelor from October 8, 2020 to October 8, 2021 undergoing primary stenting for thrombosis treatment, primary stenting for vessel occlusion, or flow diversion implant utilization for ruptured blister aneurysms. Patients were excluded if they were on concurrent oral P2Y12 inhibitors or GIlb/IIIa inhibitors while on cangrelor, if they were a prisoner, or if they were pregnant at the time of cangrelor or eptifibatide therapy. Each patient's medical record was evaluated to assess the primary efficacy endpoints of stent patency and vessel lumen flow restoration and the safety endpoints of bleeding or thromboembolic complications.

Results: The number and percent of patients achieving stent patency and vessel lumen flow restoration will be reported for efficacy endpoints. The number and percent of patients who experienced bleeding or a thromboembolic complication will be reported for safety endpoints.

Conclusions: It is anticipated that this project will contribute to the limited available data on the safety and efficacy of cangrelor in neuroendovascular patients, to support its use in this patient population.
**Title:** Comparison of oral anticoagulant use in patients with bioprosthetic valves and atrial fibrillation

**Objectives:** There has been an increase in the use of direct oral anticoagulants (DOACs) in patients with bioprosthetic valve replacements. However, patients with bioprosthetic valves have largely been excluded in trials studying the use of anticoagulants in patients with atrial fibrillation, therefore data is still limited. As a result, the use of DOACs in this patient population is still controversial. The purpose of this study was to compare outcomes with the use of oral anticoagulants in patients with atrial fibrillation and a history of bioprosthetic heart valves. The primary objective was efficacy defined by prevention of stroke or systemic thromboembolism including deep vein thrombosis, pulmonary embolism, and myocardial infarction. Secondary objectives included rates of major and minor bleeding events, and mortality.

**Methods:** This retrospective, single center, observational study included 137 patients with a history of bioprosthetic heart valve and atrial fibrillation who were admitted to Pennsylvania Hospital or who had followed up in clinic from January 1, 2018 to October 31, 2021. Patients were excluded if they had a history of a mechanical valve (including TAVR and TAVI), moderate-severe mitral stenosis, valve replacement within the past 3 months, palliative care within 30 days of initiating study drug, or diagnosis of APLS. Patients were stratified in groups according to oral anticoagulant prescribed. Medical records of patients were reviewed to obtain data. De-identified data was compiled in a secure database, and data collection was completed by thorough chart review of enrolled patients. Chi-square test was used to perform statistical analysis of the primary endpoint.

**Results:** In total, there were 4 systemic embolic events that occurred in both groups (2.9%) including myocardial infarction, deep vein thrombosis, and ischemic or unspecified stroke. Two events occurred in both the warfarin group (4.0%) and in the DOAC group (2.3%) (p=0.569). Rates of all-cause mortality at 6 months were 2.0% and 3.4% with warfarin and DOACs respectively. 28.0% patients on warfarin experienced any bleeding event as compared to 18.4% of patients on a DOAC. Rates of major bleed were 8.0% and 10.3% with patients on warfarin and DOACs respectively. 22.0% of patients on warfarin experienced a minor bleed compared to 8.0% on a DOAC.
Conclusions: Direct oral anticoagulants may be used in patients with atrial fibrillation who have a history of bioprosthetic valve replacement. As compared to warfarin, direct oral anticoagulants have both a similar efficacy and safety profile. Rates of systemic embolic events were similar between groups. Patients on a DOAC had a lower overall bleeding rate, with slightly higher incidence of major bleeding events and much lower incidence of minor bleeding events.
Conference Abstracts
May 16-18, 2022

Presenter Name: Brighton, Tessa
Organization: UMass Memorial Medical Center
Category: Cardiovascular/Critical Care
Day | Session | Room | Time: Wednesday | 6 | Crystal B | 4:00:00 PM

Authors: T. Brighton, P. Clive, K. Sargent; UMass Memorial Medical Center, Worcester, Massachusetts

Title: Multicenter analysis of safety and efficacy of direct acting oral anticoagulant utilization for treatment of venous thromboembolism in obesity

Objectives: The prevalence of adults with a high body mass index (BMI) has been increasing over the past 20 years and obesity is a risk factor for venous thromboembolism (VTE). The direct-acting oral anticoagulants (DOACs) have become the preferred anticoagulants for the treatment of VTE due to their ease of administration and lack of frequent laboratory monitoring, however limited data exists for their use in morbid obesity. Pharmacokinetic implications observed in patients of high BMI include an alteration in volume of distribution and less accurate estimates of excretion. This multicenter analysis will assess the efficacy and safety of the DOACs in the treatment of VTEs in patients with BMI >40 kg/m² compared to patients with BMI <40 kg/m² through analysis of new or worsening thrombosis and bleeding events.

Methods: Patients will be identified retrospectively through chart review based on hospital admission or presentation to the emergency department at our institution with an initial index event of an acute VTE. Baseline data to be collected will include demographic information, weight, BMI, and DOAC prescribed. Patients will be assessed for any new or worsening VTE events and any bleeding events in the 12 months following their index event.

Results: Data collection is ongoing. The risk for new or worsening VTE events and severe bleeding events per International Society on Thrombosis and Haemostasis (ISTH) criteria while on DOAC treatment will be presented.

Conclusions: Information obtained from this study may impact the broader use of DOACs in the obese patient population for VTE treatment, as well as guide our local clinical guideline recommendations at UMass Memorial Medical Center for this patient population.
Evaluation of the timing of second doses of antibiotics in sepsis and septic shock

Authors: Meghan E. Cook, PharmD; Brian R. Schuler, PharmD, BCCCP; Michael J. Schontz, PharmD, BCPS, BCCCP; Kevin C. McLaughlin, PharmD, BCPS, BCCCP; Kenneth E. Lupi, PharmD, BCPS, BCCCP; Jeremy R. DeGrado, PharmD, BCPS, BCCCP; Chanu Rhee, MD, MPH

Title: Evaluation of the timing of second doses of antibiotics in sepsis and septic shock

Objectives: The Surviving Sepsis Campaign Guidelines emphasize the importance of early interventions, including timely administration of antibiotics. Small studies have evaluated the impact of delays in subsequent doses of antibiotics and have shown variable results. Delays in the second doses of antibiotics may occur for various reasons, particularly as patients transfer from the emergency department (ED) to inpatient settings. The objective of this study is to evaluate the association of delays in second doses of antibiotics with mortality and other outcomes in patients with sepsis and septic shock, as well as evaluate risk factors for delays in second doses.

Methods: This is a single-center, retrospective analysis of patients who triggered an electronic health record-based alert for suspected sepsis in the ED and were discharged with an ICD-10 diagnosis code for sepsis or septic shock between January 1, 2018 and December 31, 2019. The primary outcome of this study is the risk-adjusted association between delayed second doses of antibiotics and mortality rates. Secondary outcomes include intensive care unit length of stay, hospital length of stay, and risk factors associated with delays in second doses of antibiotics. Univariate and multivariate analyses will be used to assess mortality and for risk factors for delays. A priori risk factors for mortality that will be included in the multivariate analysis include delayed second doses of antibiotics, baseline SOFA score, and compliance with the 3-hour sepsis bundle. Additional variables will be included if individual p values are < 0.2 in the univariate analysis. Chi-square and Fisher's exact tests will be used for nominal data and Mann-Whitney U test will be used for continuous data.

Results: The prevalence of delays in second doses of antibiotics and risk factors for delays will be presented, along with the association of delays with mortality and other outcomes in patients with sepsis and septic shock.

Conclusions: This analysis will contribute to the limited literature on the prevalence, risk factors, and clinical impact of delays in second doses of antibiotics in patients with sepsis and septic shock and inform potential strategies to mitigate these delays and improve outcomes.
Impact of a nurse-driven heparin nomogram in cardiothoracic surgery patients at Einstein Medical Center Philadelphia

**Objectives:** Historically at Einstein Medical Center Philadelphia (EMCP), a heparin infusion after cardiothoracic (CT) surgery was ordered, monitored, and adjusted by providers. A nurse-driven Cardiac Surgery Heparin Nomogram (CSHN) was implemented at EMCP for post-operative CT surgery patients to begin on a heparin infusion at 12 units/kg/hr with a maximum initial rate of 1,000 units/hr and no boluses. The purpose of this study was to compare the safety and efficacy of the new nurse-driven CSHN to the previous provider-driven standard of care in post-CT surgery patients.

**Methods:** This retrospective, single center, quasi-experimental study included patients in two separate time cohorts, June 2018-December 2019 and June 2021-December 2021, before and after the implementation of the CSHN. Inclusion criteria consisted of inpatients ≥18 years old who underwent CT surgery and were initiated on a heparin infusion with ≥1 therapeutic aPTT. Patients not utilizing the CSHN after implementation on June 14, 2021 were excluded. Twenty-four patients in the pre-nomogram group and 12 patients in the post-nomogram group were required to detect a six-hour difference in the primary outcome of time to first therapeutic aPTT to provide 90% power with an alpha of 0.05. The student's t-test was used for the primary outcome and continuous variables. The Fisher's exact test was used for categorical variables. Additional efficacy endpoints were percentage of time in goal range, time from first out-of-range aPTT to dose adjustment, and incidence of thromboses. Safety outcomes included any incidence of major bleeding defined by the Global Registry of Acute Coronary Events (GRACE), interventional procedures due to bleeding, and death.

**Results:** A total of 24 patients in the pre-nomogram group and 13 patients in the post-nomogram group were included in the analysis. The mean time to first therapeutic aPTT (hrs) was faster in the post-nomogram group vs. the pre-nomogram group, (12.3 Â± 8.3 vs. 22.0 Â± 14.4; p=0.04). The time to heparin dose adjustment (hrs) following the first out-of-range aPTT was 6.6 Â± 13.5 in the pre-nomogram group and 5.6 Â± 6.1 in the post-nomogram group (p=0.81). The percentage of time in therapeutic range was 38.8% in the pre-nomogram group and 51.2% in the post-nomogram group (p=0.08). There were 66.7% and 61.5% of patients who...
met any bleeding outcome (p=1.00) with 33.3% and 30.8% of patients who required an interventional procedure due to major bleeding (p=1.00), in the pre-nomogram group and post-nomogram group, respectively. There were no thromboses or deaths.

**Conclusions:** Implementation of the CSHN resulted in faster times to first therapeutic aPTT. The nomogram proved to be efficacious and safety outcomes were comparable to prior standards of care at EMCP.
**Presenter Name:** Dager, William  
**Organization:** Brigham and Women's Hospital, Boston, MA  
**Category:** Cardiovascular/Critical Care  
**Day | Session | Room | Time:** Tuesday | 4 | Crystal B | 3:15:00 PM

**Authors:** William R. Dager, PharmD; Brian Schuler, PharmD, BCCCP; Mary Kovacevic, PharmD, BCCCP, BCPS; Jeremy DeGrado, PharmD, BCCCP, BCPS; Kevin Dube, PharmD, BCCCP, BCPS

**Title:** Evaluation of the order of vasopressor discontinuation strategies in patients with septic shock

**Objectives:** In the 2021 Surviving Sepsis Campaign Guidelines, norepinephrine (NE) is preferred as the first-line agent for adults with septic shock, while the addition of vasopressin (VP) is reserved for patients with inadequate mean arterial pressures (MAPs) despite norepinephrine. There is limited data regarding the order of vasopressor discontinuation in patients on concomitant NE and VP. This study aims to look at the incidence of hypotension following vasopressor discontinuation across intensive care units (ICU).

**Methods:** This was a single-center, retrospective cohort study at Brigham and Women’s Hospital that was approved by the Mass General Brigham Institutional Review Board. Adult ICU patients diagnosed with septic shock (ICD-10 R65.21) and having received concomitant norepinephrine and vasopressin infusion for at least 4 hours as the final vasopressor agents were included from January 1st, 2018, to December 31st, 2019. Patients were excluded if upon discontinuation of NE or VP an alternative vasoactive agent was infused, or if the patients were diagnosed with cardiogenic shock. The primary outcome was the incidence of rebound hypotension within 24 hours as defined by two consecutive mean arterial pressures (MAP) less than 65 mmHg and/or the initiation or up-titration of vasopressors or a fluid bolus. Secondary outcomes included the time to hypotension and the incidence of hypotension within 12 hours post-discontinuation. Continuous data were evaluated with paired t-tests or Mann-Whitney U tests, and categorical data were analyzed using chi-squared tests.

**Results:** In the 265 included patients, NE and VP were discontinued first in 198 and 67 patients, respectively. There was no difference in the incidence of hypotension among patients who had NE or VP discontinued first within 24 hours [98 (49.5%) vs. 35 (52.2%), p=0.7)] or 12 hours [86 (43.4%) vs. 31 (46.3%), p=0.79], respectively. There was no difference in the median time to hypotension between the NE and VP groups [4 hr (1.7:9.8)] vs. 4.3 hr (2:12.3), p = 0.55].

**Conclusions:** The incidence of rebound hypotension was not significantly lower when NE was discontinued before VP at either 12 or 24-hours post-vasopressor discontinuation. Further clinical trials evaluating vasopressor discontinuation are warranted.
Evaluation of the safety and efficacy of peripheral vasopressors to decrease central line placement and associated bloodstream infections

Methods: This is an IRB approved, single center retrospective chart review conducted as pre/post-analysis. Patients 18 years and older admitted to an intensive care unit (ICU) were included if vasopressor duration was expected to be less than 72 hours at the same infusion site, met peripheral catheter requirements, and were receiving a low or moderate dose of norepinephrine, phenylephrine, vasopressin or epinephrine. Patients were excluded if their vasculature did not support placement of two PIV sites, PIV sites did not have brisk blood return, had a limb restriction, or had a metacarpal line. The primary efficacy outcomes of this study are number of central lines placed and number of central line days. It was determined that sample sizes of 250 in each cohort would afford 82% power using a 57% reduction in central line placement from a previous institutional analysis as the baseline for significance. The primary safety outcome is the number of extravasation events attributed to peripheral administration of vasopressors. Secondary outcomes include risk factors for extravasation, time to vasopressor initiation, incidence of CLABSI, ICU length of stay (LOS), hospital LOS and mortality.

Results: Results regarding number of central lines placed and central line days as well as data describing the number of extravasation events, time to vasopressor initiation, and incidence of CLABSIs will be presented.

Conclusions: This study aims to compare 250 patients post-implementation of a peripheral vasopressor protocol with 250 patients in a pre-intervention control group, to investigate the
safe use of peripherally administered vasopressors. The authors hypothesize that central line
days and central line placement will be reduced by the introduction of a peripheral vasopressor
protocol. Additionally, the authors hope to identify decreased time to initiation of vasopressors
with use of PIV administration and that rates of CLABSIs are decreased through a reduction in
unnecessary placement of central lines.
Title: Outcomes of a phenobarbital versus a benzodiazepine protocol for treatment of acute alcohol withdrawal in intensive care unit (ICU) patients

Objectives: The purpose of this research is to determine if patients admitted to the ICU for alcohol withdrawal syndrome (AWS) who are treated with a target Richmond Agitation and Sedation Scale (RASS) phenobarbital-only dosing protocol have better outcomes than patients who were treated with a traditional Clinical Institute for Withdrawal Assessment-Alcohol revised (CIWA-Ar) benzodiazepine protocol. Although benzodiazepines are the predominant medication used in clinical practice to treat AWS, phenobarbital is an alternative agent, especially for patients who are refractory to traditional benzodiazepine treatment. Several studies have shown improved outcomes in patients who receive phenobarbital for AWS compared to benzodiazepines, including shorter ICU length of stay and lower rates of mechanical ventilation.

Methods: In 7/2021, a pilot provider-driven protocol was implemented in the ICU utilizing titrating doses of phenobarbital to a target RASS of < 1. This is a cohort study of patients admitted to the ICU who received benzodiazepines based on the CIWA protocol for AWS between 7/1/2019 and 6/30/2021 compared to ICU patients who received phenobarbital for AWS between 7/1/2021 and 4/1/2022. Patients were identified and charts were reviewed using the electronic medical record. Descriptive statistics will be utilized to compare the benzodiazepine versus the phenobarbital treatment groups.

Results: Data points include but are not limited to baseline demographics, ICU and hospital length of stay, rate of mechanical ventilation, and total dose of lorazepam equivalents and phenobarbital that patients received during their treatment.

Conclusions: No conclusion can be made at this time. However, it is anticipated that patients who are treated with phenobarbital will have a shorter ICU length of stay and have a lower rate of mechanical ventilation than patients treated with the traditional CIWA-benzodiazepine protocol.
Author(s): Douglas DeSimone, PharmD., Trisha Patel, PharmD., BCPS, BCCCP

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Assessment of safety of sacubitril/valsartan in patients with heart failure with reduced ejection fraction and advanced kidney disease

Objectives: Sacubitril/valsartan was shown to reduce morbidity and mortality in the PARADIGM-HF trial, however the trial excluded patients with advanced kidney disease. Heart failure with reduced ejection fraction (HFrEF) and chronic kidney disease (CKD) are common comorbidities and a recent meta-analysis found that approximately 55% of patients with HFrEF also had moderate-severe CKD (eGFR <60 ml/min/m2). Given the limited safety data regarding sacubitril/valsartan use in patients with advanced kidney disease, this study was designed to evaluate the real-world safety data, specifically hyperkalemia and hypotension, with the use of sacubitril/valsartan during hospital admissions in patients with and without advanced CKD.

Methods: This retrospective study included patients who were admitted to a tertiary academic medical center between August 2018 and December 2021. Patients were identified if they had an order placed for sacubitril/valsartan during their admission, and had a recently documented ejection fraction (EF) of <45%. There were no specific exclusion criteria. A total of 176 patients were included. Patients were assigned to two groups: eGFR <30 ml/min/m2 and eGFR >30 ml/min/m2. The primary outcome included rates of documented or suspected hypotension (systolic blood pressure <90 mmHg and/or sacubitril/valsartan dose decrease), hyperkalemia (K+ > 5.5 mmol/L), and inpatient drug discontinuation rates between the two groups. Secondary outcomes will include rates of dose titration while admitted to the hospital.

Results: The mean age was similar between patients with an eGFR <30 ml/min/m2 and eGFR >30 ml/min/m2 (65.8 years + 12.3 vs 64.3 + 11.7 years, respectively). Gender was equally distributed in the eGFR <30 ml/min/m2 group, and there were more men than women in the eGFR >30 ml/min/m2 group (70.5% vs 29.5%, respectively). Median EF was 30% [IQR 15-45] and 25% [IQR 12.5-37.5] in the eGFR <30 ml/min/m2 and eGFR >30 ml/min/m2 groups, respectively. The rate of adverse events was numerically, but not statistically significantly, higher in the eGFR <30 ml/min/m2 group compared to the eGFR >30 ml/min/m2 (37.5% vs 25% respectively, p-value = 0.074).

Conclusions: No significant difference was found in the rate of adverse events with sacubitril/valsartan use in patients with and without advanced CKD. This data is limited by
sample size, retrospective design, and other confounding factors that prevent us from drawing a cause and effect relationship. Based on this study, the use of sacubitril/valsartan in patients with an eGFR >30 ml/min/m² continues to have a favorable safety profile compared to patients with an eGFR <30 ml/min/m². When used in advanced CKD patients, consistent clinical monitoring is warranted to prevent potential adverse effects.
Assessment of Clinical Institute Withdrawal Assessment for Alcohol (CIWA) protocol in a community hospital critical care unit

Objectives: Alcohol withdrawal is a common occurrence in patients who have been admitted in the hospital setting. Clinical Institute Withdrawal Assessment for Alcohol (CIWA) is a tool used to assess, diagnose, and treat patients suffering from alcohol withdrawal. The CIWA protocol has been highlighted as an area in need of improvement by staff members within the critical care unit of this community hospital. The objective of this project is to assess critical care nurse perception of the current CIWA protocol to determine opportunities for CIWA protocol improvement.

Methods: An anonymous survey, utilizing 7-point Likert Scale, multiple choice questions, and open response, was distributed to the critical care unit nurses to assess their perception of the current CIWA protocol. The anonymous survey consisted of questions regarding demographics of the nurses, perception of the current CIWA protocol, preferences on education and training on use of the current CIWA protocol, and suggestions for protocol improvement.

Results: Twenty-five critical care unit nurses completed the survey. Data revealed 8% of nurses strongly agreed that the current CIWA protocol properly assesses patients' alcohol withdrawal status and 0% strongly agreed that the protocol effectively manages the symptoms of alcohol withdrawal. 56% of nurses believed that the current CIWA protocol either over or under prescribes medication. 64% of nurses admit to at least sometimes having a number in mind prior to scoring a patient, 60% admit to at least sometimes overestimating the CIWA score, and 40% admit to underscoring a patient at least sometimes due to perceived drug-seeking behavior. The majority of nurses preferred annual training in terms of education. Increased utilization of phenobarbital and scheduled sedative doses were two of the most popular suggestions for protocol improvement.

Conclusions: Nursing utilization of the CIWA protocol could be optimized within the critical care unit of this community hospital. The survey data gathered, alongside the suggestions, will be utilized to improve training. One proposed change, based on these results, is to increase provider knowledge of phenobarbital use. Although it is the preferred agent for critical care CIWA patients in this hospital, the nurses perceive it as being underutilized.
Comparison of tenecteplase versus alteplase in the treatment of acute ischemic stroke (CAPTAIN-AIS)

Objectives: Treatment of acute ischemic stroke (AIS) focuses on early reperfusion to minimize neurological impairment, long-term disability, and stroke-related mortality. Thrombolytics used in the treatment of AIS include alteplase and tenecteplase. Our study aims to determine if tenecteplase can show improved or equivalent door-to-needle times and neurological and functional outcomes when compared to alteplase. The objective of this study is to compare the percentage of patients who receive alteplase or tenecteplase for AIS within 30 minutes from arrival.

Methods: This is an IRB-approved, single-center, two-phase chart review at a tertiary academic medical center designed to compare the door-to-needle times and patient outcomes in adult patients who received thrombolytic therapy for AIS with either alteplase or tenecteplase. An initial chart review was conducted for patients who received alteplase from October 2020 to June 2021 and a second-phase chart review is being conducted for patients who receive tenecteplase from October 2021 to June 2022. The primary endpoint of the study is the percentage of patients who receive a thrombolytic within 30 minutes from arrival. Data collection will be completed through the Hackensack Meridian Health (HMH) RedCap system and data analysis will be conducted utilizing descriptive statistics.

Results: Out of 56 patients treated with alteplase for AIS in the emergency department, 17 patients (30.4%) received the thrombolytic within 30 minutes of arrival to the hospital. The authors hypothesize that tenecteplase for AIS will be associated with improved door-to-needle times and a higher percentage of patients receiving the thrombolytic within 30 minutes of arrival in comparison. It is also theorized that tenecteplase will show equivalent or superior functional and clinical outcomes compared to alteplase.

Conclusions: Based on the preliminary results and previously published literature, the authors anticipate that tenecteplase will be a safe and effective option in AIS. Following the evaluation of collected data, the authors hope to utilize study findings to expand the existing body of literature and aid other institutions in developing protocols for the use of tenecteplase in AIS.
Title: Evaluation of anticoagulation dosing for venous thromboembolism (VTE) prevention in non-critically ill COVID-19 patients

Objectives: COVID-19 (SARS-CoV-2) virus in hospitalized patients can lead to poor clinical outcomes such as thrombosis and inflammation. Thromboprophylaxis is associated with reduced risk of morbidity/thrombotic events in COVID-19 patients and is recommended by several guidelines including National Institutes of Health (NIH). The aim of the study was to evaluate the incidence of transfer to intensive care unit (ICU) in patients receiving VTE prophylaxis via direct oral anticoagulant (DOAC), intermediate dosing, or full therapeutic dosing with heparin or enoxaparin.

Methods: It was a retrospective, observational cohort study. Non-ICU COVID-19 patients were included if they received DOAC, intermediate, or full therapeutic dosing for heparin or enoxaparin for VTE prophylaxis. Primary outcome was the percentage of patients transferred to ICU from non-ICU unit during hospitalization requiring organ-support. Secondary outcomes were incidence of bleeding events, thrombocytopenia, thrombotic events, and mortality.

Results: There was a total of 55 patients included in the study. Out of those patients, 25.4% received intermediate dose and 49% received full dose of heparin or enoxaparin, and 25.4% received a DOAC. Out of all participants, 27.2% had a transfer to the ICU in their admission. Of those patients transferred to the ICU, 40% were from the intermediate group, 46.6% from the full dose group, and 13.3% from the DOAC group. However, the difference among the groups for primary outcome was not statistically significant.

Conclusions: In conclusion, neither full or therapeutic doses of heparin or enoxaparin nor DOAC showed significant benefit in reducing the risk of escalation of care in therapy, specifically in preventing transition to the ICU and requiring organ support. Some limitations to the study include low number of included patients, potential for confounding factor when patient received multiple doses of thromboprophylaxis during admission, and the retrospective design of the study.
Conference Abstracts  
May 16-18, 2022

**Presenter Name:** Eluma, Favour  
**Organization:** UVA Health Prince William Medical Center  
**Category:** Cardiovascular/Critical Care  
**Day | Session | Room | Time:** Tuesday | 4 | Magnolia B | 4:15:00 PM

**Authors:** Favour Eluma, PharmD; Hina Afaq, PharmD, BCPS; Nikisadat Mehdizadegan, PharmD, BCCCP, BCPS

**Title:** Evaluation of anticoagulation dosing for venous thromboembolism (VTE) prevention in non-critically ill COVID-19 patients

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Predictors of rate control failure in critically ill patients with atrial fibrillation and rapid ventricular response

Atrial fibrillation (AF) is a common complication of critical illness and places patients at risk for hemodynamic instability. The recommended first line treatment for AF with rapid ventricular response (RVR) is rate control therapy with metoprolol, esmolol, or diltiazem. Failure of rate control therapy is defined as progression to second line agents. To date, there has been no risk factor analysis of predictors of progression to second line agents in critically ill patients with AF and RVR. Identification of these risk factors may help practitioners determine which therapy to use initially for patients with AF and RVR in the intensive care unit (ICU).

Methods: This was a retrospective, Investigational Review Board approved study in which medical records of adult patients admitted to an ICU at Geisinger over a five-year period were reviewed. Patients were included if they had an inpatient diagnosis of AF with RVR and received at least one dose of a first line rate control agent within one hour of a heart rate (HR) ≥110 beats per minute. Pertinent data from each patient profile was collected including baseline demographics and co-morbidities, as well as inpatient diagnoses, medications, and laboratory values prior to the episode of AF with RVR. The primary end point for this study is incidence of rate control failure defined as progression to the use of second line agents including amiodarone, digoxin, or cardioversion. Statistical analyses performed will include a univariate analysis to identify differences between groups and a multivariate analysis using logistic regression to identify associations between specific risk factors and failure of first line rate control therapy. Variables of interest were compared using the Chi-squared test or unpaired student t-test for categorical and continuous data, respectively.

Results: The study objective, to determine the incidence of rate control failure in critically ill patients with AF and RVR and describe associated risk factors, will be answered based on the data collected.

Conclusions: It is anticipated that this project will identify risk factors associated with failure of first line rate control agents for critically ill patients with AF and RVR. Identification of these predictors may assist clinicians in choosing appropriate initial therapy.
Outcomes in patients who received a second vasopressor agent at an Urban Medical Center

Objectives: The mainstay of treatment in patients who present with shock includes fluid resuscitation and vasopressor therapy. Vasopressors work by improving vascular tone and organ perfusion. Although norepinephrine is generally accepted as a first line agent, studies have suggested the early administration of a second vasopressor can help prevent adverse effects commonly seen with high dose norepinephrine including increased mortality rates and limb ischemia. The purpose of this study is to evaluate the impact of timing of initiation of a second vasopressor agent on reaching goal mean arterial pressure (MAP) or systolic blood pressure (SBP).

Methods: Single center, retrospective, observational chart review of patients who received two or more vasopressor agents between 8/1/2021 and 1/1/2022. Patients who received two or more vasopressors were included in this study. Patients who were initiated on a vasopressor during a code blue event during their hospital stay were excluded from the study. Descriptive analyses of demographics, patient outcomes, initial, and goal MAP or SBP, as well as dose, timing, and vasopressors prescribed were collected. The primary outcome in this study is to compare mortality in relation to time to initiation of second vasopressor agent. Secondary endpoints include dose of the initial vasopressor at time of initiation of second agent, initial rate of second vasopressor agent, and time to reach goal MAP or SBP.

Results: Fifty-three of three hundred twenty-nine patients screened met inclusion and exclusion criteria. Average age of participants in this study was 64 years old (+ 17) and 62% of the population was male. Patient's presented with an initial MAP of 64 mmHg (IQR 56-70.5). Survival rate was higher in patients who were started on a second vasopressor agent at a median time of 342 minutes (IQR 91-759). In comparison, patients who did not survive had a median time to second vasopressor agent of 919 minutes (IQR 255-2,265).

Conclusions: Our findings suggest earlier initiation of a second vasopressor was associated with a lower incidence of in hospital mortality. Additional data is needed to determine if there is an optimal time to initiate a second vasopressor agent.
Authors: Rachel Fernandes, PharmD; Tara Lech, PharmD, BCPS

Title: Perioperative management of direct oral anticoagulant therapy

Objectives: Varying and sometimes conflicting guideline recommendations make it challenging for providers to determine the best approach to perioperative management of direct oral anticoagulants (DOACs). Recommendations differ based on renal function, bleeding risk, and DOAC pharmacokinetic properties. Assessing practitioners' periprocedural management of DOAC therapy is the first step toward identifying areas of improvement to provide a more standardized approach to care.

Methods: Retrospective review of 192 patients on a DOAC undergoing a low, moderate or high-risk procedure between January 2021 through June 2021 was performed. Procedures were classified as either low or high bleeding risk according to Lahey Hospital and Medical Center's (LHMC) DOAC interruption assessment tool. Data from the electronic health record and patient information was entered into a central database for review. Information collected included DOAC dose and indication, renal function, and the type of anesthesia used. Bleeding or thrombotic events within 30 days of the procedure, along with the presence or absence of a clearly documented periprocedural plan, were recorded. Fifty providers were also asked to answer a 15-question survey to gain a better sense of their comfort with perioperative management of DOAC therapy. The first part of the survey focused on familiarity with current practice guidelines, documentation strategies, and approaches over the role of anticoagulation bridging. The second part consisted of case-based questions to detect variances in approach to perioperative DOAC plans when presented with the same low and high-risk scenarios.

Results: Of the 192 included patients, procedures were broken down into four categories: gastrointestinal (GI) (n=110), orthopedic (n=12), general surgery (n=35), and cardiovascular (n=35). Full documentation for periprocedural management of DOAC therapy was seen in 61% of GI, 92% of orthopedic, 54% of general surgery, and 34% of cardiovascular procedures. When assessing how long DOAC therapy was held, interruption periods ranged from no hold to five day holds, both pre- and post-procedure. Overall, 21 patients experienced a clinically relevant non-major bleed and no patients experienced a major bleed within 30 days of their procedure. One patient experienced a deep vein thrombosis within 30 days of a GI procedure. Of 38 providers who completed the survey (76%), only 6 providers reported being very comfortable with periprocedural management of DOAC therapy. Providers reported following various
guidelines, which was evident in the approaches to the case-based questions. Almost all providers (97%) agreed that a more standardized protocol to peri-operative use of DOAC therapy is warranted.

**Conclusions:** Standardizing the approach and documentation for specific procedures at LHMC can improve overall patient care and minimize the risk of adverse events.
**Conference Abstracts**  
May 16-18, 2022

**Presenter Name:** Franklin, Sarah  
**Organization:** The University of Vermont Medical Center  
**Category:** Cardiovascular/Critical Care  
**Day | Session | Room | Time:** Wednesday | 6 | Crystal B | 3:45:00 PM

**Authors:** Sarah Franklin, Jeffrey Endicott, MaryEllen Antkowiak, Patrick Neilan, Amanda G Kennedy, Bradley Tompkins

**Title:** Comparison of initial anti-Xa levels following a bolus or no bolus dose of unfractionated heparin for the treatment of acute venous thromboembolism.

**Objectives:** Venous thromboembolism (VTE) is a disease state that commonly causes hospital admission, in addition to significant morbidity and mortality. The main treatment for initial and recurrent VTE events is prompt anticoagulation with medications like unfractionated heparin (UFH). UFH is one of the most widely used agents for the acute inpatient management of thromboembolism because of its easily titratable nature, short half-life, and ability for therapeutic monitoring. Despite its frequency of use, the impact of initiating therapy with a bolus dose remains unknown. The objective of the study was to determine whether the proportion of patients with therapeutic initial anti-Xa levels differs following either administration or omission of a bolus dose of UFH for the treatment of acute VTE.

**Methods:** Medical records of adult patients aged 18 years and older who were admitted from October 1st, 2018 to October 31st, 2021 with a diagnosis of acute VTE at the University of Vermont Medical Center were reviewed. Patients were identified through ICD-10 codes for deep vein thromboembolism (DVT) or pulmonary embolism (PE). Only those whose initial anti-Xa level was drawn more than 5 hours post-initial UFH and less than 7 hours post-initial UFH dose were included. Patients were excluded if they didn't receive UFH as indicated on the institutional protocol. The primary outcome, analyzed with a chi-squared test, was the proportion of patients with therapeutic initial anti-Xa level (goal 0.3-0.7 units/mL) among those who did or did not receive a bolus dose of UFH. The secondary outcome, analyzed with an unpaired student-t test, was the mean anti-Xa level at the initial 6-hour blood draw following UFH bolus or no bolus. The safety outcome assessed was incidence of bleeding in the bolus group compared to the no bolus group.

**Results:** 211 patients were included in the study analysis (48% female, 52% male). Among patients who received a bolus, 38.5% were in the therapeutic range at initial draw, compared with 54.1% in the non-bolus group (p-value=0.081). The mean anti-Xa level was 0.75 in the bolus group compared to 0.5 in the non-bolus group (p-value= 0.004).

**Conclusions:** Using a bolus of UFH resulted in no significant difference in the proportion of patients with therapeutic anti-Xa levels at the first blood draw. There was a significant difference...
in the mean anti-Xa levels at 6 hours, with the bolus group having a greater mean level than no bolus. These results might help differentiate between the clinical need for bolus-dose UFH for the treatment of VTE and support the need for larger, prospective studies in the future.
Presenters Name: Gamaleldin, Aia  
**Organization:** The Brooklyn Hospital Center  
**Category:** Cardiovascular/Critical Care  
**Day | Session | Room | Time:** Wednesday | 6 | Crystal B | 4:15:00 PM

**Authors:** A. Gamaleldin, R. Cope; The Brooklyn Hospital Center (TBHC), Brooklyn, New York

**Title:** Prescriber management of direct oral anticoagulants during the perioperative period

**Objectives:** Anticoagulants are the mainstay therapy for treatment and prophylaxis of thromboembolic diseases. However, anticoagulants are not benign and are associated with a high risk of complications. Appropriate perioperative management of anticoagulants is of special importance in order minimize bleeding risks during surgery while simultaneously minimizing the risk of clot development. According to the National Joint Commission's National Patient Safety Goal for anticoagulant therapy, the decision to stop an anticoagulant, use a bridging medication, or restart an anticoagulant in the perioperative period, should be based on organization-approved protocols and evidence-based practice guidelines. Given concerns for inconsistency of care between clinical practice and evidence-based guidelines, the objective of this study is to examine current periprocedural management of direct oral anticoagulants (DOACs) at The Brooklyn Hospital Center (TBHC) and evaluate whether current practices are in accordance with evidence-based guidelines and landmark trials. Data obtained will assist in creating institution-specific, standardized periprocedural guidance for anticoagulation including DOACs.

**Methods:** This project is a retrospective chart review of all patients admitted to the surgery service within the TBHC system. Patients prescribed apixaban, rivaroxaban, or dabigatran during their time of admission for an elective or emergent surgery at TBHC from January 1, 2020 to January 1, 2022 were included. The electronic medical record was utilized to identify patients and collect data. Primary endpoint to be examined is percent of patients whose periprocedural DOAC management is inappropriate as defined by the current recommended practices in the DOAC Playbook, published by the Anticoagulation Forum (AC Forum). Secondary endpoints to be examined include percent of patients who experienced a bleeding episode or thrombotic event during admission for surgical procedure prior to, during, or after their surgical procedure until discharge.

**Results:** The number and percentage of patients whose periprocedural DOAC management deviated from the current recommended practices will be recorded and results will be presented.

**Conclusions:** Appropriate perioperative management of DOACs is of special importance in order minimize bleeding risks during surgery while simultaneously minimizing the risk of
thrombosis. Data obtained from this quality improvement project will assist in creating institution-specific, standardized periprocedural guidance for anticoagulation including DOACs.
**Objectives:** Direct oral anticoagulants (DOACs) are an appealing option for anticoagulation due to ease of administration and lack of required therapeutic monitoring. The use of DOACs in obesity and cirrhosis, however, has long been a gap in the literature. A 2021 update review of available data published by the International Society on Thrombosis and Haemostasis includes recommendations for the use of select DOACs (rivaroxaban and apixaban) for venous thromboembolism (VTE) treatment and prophylaxis in obesity. Similar efficacy and safety outcomes were found in obese patients taking apixaban and rivaroxaban compared to warfarin for VTE treatment, providing evidence for the use of DOACs in this population. Additionally, the safety of DOACs in cirrhosis is not well defined and traditionally these patients are treated with low molecular weight heparin or warfarin. A retrospective observational cohort study compared DOAC therapy to warfarin in this population and found no difference in the rate of major bleeding at 90 days, incidence of recurrent embolic and stroke events or all-cause mortality. Our study will assess the rate of bleeding and recurrent VTE in patients with obesity and cirrhosis.

**Methods:** Patients treated for VTE with cirrhosis and/or BMI $\geq 30$ kg/m$^2$ will be reviewed to determine the safety and efficacy of DOACs, including incidence of bleeding within 3 months of initiation and recurrent VTE up to 12 months after initiation. Changes in anticoagulation including choice of medication and dose will be collected, both during admission and post-discharge, up to 12 months. Additionally, data points to be collected include: age, sex, race, ethnicity, weight, height, BMI at hospital admission, presence of liver disease, stroke, hypercoagulable states and active malignancy. History of SARS-Co-V-2 infection (COVID-19) and COVID-19 vaccine status will be collected as will concomitant use of medications that interact with anticoagulation and/or can increase the risk of bleeding. Clinical data for this retrospective chart review will be extracted from patient electronic medical records (Epic Â®, Verona, WI), and will be assessed via descriptive statistics.

**Results:** The number and percentage of patients prescribed a DOAC that result in recurrent VTE and/or major and minor bleeding events will be presented.
**Conclusions:** This project adds to the growing literature that the use of DOACs for venous thromboembolism in patients with obesity and/or cirrhosis may be considered safe and effective.
**Authors:** H. Gilchrist, A. Esteves, M. Roginski; Dartmouth-Hitchcock Medical Center, Lebanon, New Hampshire

**Title:** Impact on diabetic ketoacidosis (DKA) resolution after implementation of a two bag fluid DKA orderset

**Objectives:** Diabetic ketoacidosis (DKA) is a serious acute complication of both type 1 and type 2 diabetes, and guidelines recommend the prompt management of DKA through the correction of dehydration, hyperglycemia, and electrolyte imbalances. Prior studies at this institution demonstrated opportunities for improvement with regard to management of DKA, therefore a new 2 bag protocol was adopted in an attempt to improve therapeutic outcomes in this patient population. This quality improvement project is intended to assess prescribing patterns and management of DKA before and after implementation of a new DKA orderset in patients within the inpatient setting.

**Methods:** All patients admitted as an inpatient with DKA between January 1, 2021, and February 28, 2022, were included in the chart review and separated into two cohorts, one cohort prior to implementation of the new orderset, and the other cohort after implementation of the new orderset. Inclusion criteria for the analysis consisted of all patients greater than 18 years old who had the DKA orderset initiated during their admission. Patients were excluded if they did not meeting the definition for DKA after chart review and if they were transferred from an outside facility after the administration of insulin. The primary outcome of this project is to evaluate the effect of a DKA standardized orderset on time to anion gap closure and beta-hydroxybutyrate normalization. Secondary outcomes of this study include length of hospitalization, time to resolution of DKA and transition to subcutaneous insulin, and number of patients with hypoglycemic events.

**Results:** Full data analysis for this project is still ongoing. In total, 149 patients had the orderset initiated during their admission and were included in the analysis, 60 in the first cohort, and 89 in the second cohort. Average age of patients admitted in the cohorts was 52 and 52.6 years, respectively. Average weight among patients in the cohorts was 84.3 and 86.1 kilograms, respectively. 46.7% and 40.4% of patients had type 1 diabetes in the first and second cohorts, respectively. Average time to anion gap closure was 16.9 ± 10.9 hours in the first cohort and 12.6 ± 5.8 hours in the second cohort. Time to beta-hydroxybutyrate normalization was 25.6 ± 20 hours in the first cohort and 15.5 ± 16.9 hours in the second cohort.
**Conclusions:** Implementation of a new 2 bag DKA protocol led to an average reduction in time to anion gap closure of 4.3 hours. When full data analysis is completed, this project will likely display an improvement in patient care by identifying reductions in time to anion gap closure and beta-hydroxybutyrate normalization as well as reductions in hospital length of stay by using a 2 bag protocol for DKA treatment.
Descriptive analysis of platelet reactivity values to guide periprocedural antiplatelet dosing in neuroendovascular patients

**Objectives:** The P2Y12 inhibitors are used for the prevention of thrombosis in neuroendovascular procedures such as cerebral aneurysmal coiling and intracranial stenting. Dosing for these agents is extrapolated from their use in cardiac indications, and evidence for dosing regimens in neuroendovascular procedures is minimal. Patients are often continued on P2Y12 inhibitors for 3-6 months post procedure. While there are several small studies describing clopidogrel titration using platelet reactivity unit (PRU) values, ticagrelor has largely been excluded from the literature. This study aims to describe dose titration and medication change patterns according to PRU values for ticagrelor and clopidogrel at our institution.

**Methods:** This was a single-center, retrospective analysis of adult patients who underwent a neuroendovascular procedure and received a P2Y12 inhibitor with PRU testing from June 25th, 2015 to October 1st, 2021. The major outcome of this analysis was the percentage of patients who had their P2Y12 inhibitor adjusted based on PRU value(s). Safety outcomes included hemorrhagic events, thromboembolic events, and further neurosurgical interventions. P2Y12 hyper-responder was defined as an initial PRU <80, and a hypo-responder was defined as an initial PRU >220.

**Results:** A total of 80 patients were evaluated and 33 met criteria for inclusion. There were 54 PRU values obtained across included patients. The initial P2Y12 inhibitor regimen was clopidogrel 75mg daily for 93.9% of patients. Stent placement was the most common neurosurgical intervention (33.3%), followed by pipeline embolization (21.2%) and coil embolization (18.2%). The median PRU prior to any P2Y12 inhibitor regimen adjustment was 97.5. Eleven patients (33.3%) had their P2Y12 inhibitor regimen changed, with 81.8% of changes related to PRU value. P2Y12 hypo-responder criteria was met for 5 (9.3%) patients, with 2 (40%) PRU readings resulting in a regimen change. P2Y12 hyper-responder criteria was met for 14 (42.4%) patients with 11 (47.8%) preemptive PRU values <80 resulting in a regimen adjustment. The median PRU for preemptive values <80 pre-dose adjustment was 8 (IQR 3.25-22), while the median PRU without regimen adjustment was 29 (IQR 15.5-72). Post-change
PRUs were available for 7 regimen adjustments. PRU increased after 5 (71.4%) changes. In the hyper-responder population, no safety event occurred following a regimen change.

**Conclusions:** Changes in P2Y12 inhibitors were most seen in patients with low PRU values, with no safety events in the hyper-responder population post dose change. Further studies are needed to determine the clinical implications of dose adjustments in P2Y12 hyper-responders.
Retrospective analysis of compliance with guideline-directed lipid lowering therapy after acute coronary syndrome: a focus on non-statin therapies

**Authors:** R. Goho, JI. Melaragno, C. Ruscio, K. Manou; University of Rochester Medical Center, Rochester, New York

**Title:** Retrospective analysis of compliance with guideline-directed lipid lowering therapy after acute coronary syndrome: a focus on non-statin therapies

**Objectives:** The purpose of this study was to assess the percentage of subjects with a low-density lipoprotein cholesterol (LDL-C) ≥70 mg/dL on maximally tolerated statin therapy without guideline-directed escalation of therapy (EOT) post-acute coronary syndrome (ACS).

**Methods:** This was a retrospective, observational study in adult patients admitted for ACS to an academic medical center from June 1st, 2020 to May 31st, 2021. Adult patients with an LDL-C ≥70 mg/dL (on admission or up to 1 month prior) treated with a high-intensity or maximally tolerated statin were included. The primary outcome was the percentage of subjects that did not receive guideline-directed addition of ezetimibe or a proprotein convertase subtilisin/kexin type 9 inhibitor (PCSK9i) within 90 days of the ACS event. Secondary outcomes included characteristics associated with EOT, non-escalation of therapy (non-EOT), LDL-C change and coronary heart disease (CHD) events at 90 days.

**Results:** A total of 95 patients with an ACS event were included. Mean age was 66.7 ± 11.5 years, 36.8% of patients were female, and 86.3% of patients were white. ACS events included: 28.4% with ST-segment elevation myocardial infarction (STEMI), 57.9% with non-ST-segment elevation myocardial infarction (NSTEMI), and 13.7% with unstable angina. Eighty-three patients (87.4%) did not receive guideline-directed EOT within 90 days of ACS event. Twelve patients (12.6%) received EOT including 7 patients prescribed ezetimibe and 5 patients prescribed a PCSK9i. Two patients in the non-EOT group experienced a coronary event (1 nonfatal myocardial infarction, 1 coronary revascularization), while there were no events in the EOT group. The rate of CHD was not different between groups (p=0.587). In the univariate analysis, only age (p=0.016) and baseline LDL-C >100 mg/dL (p<0.001) were associated with EOT. For patients with an evaluable follow-up lipid panel (32/95), more patients that received EOT had an LDL-C <70 mg/dL (66.6% vs 46.2%; p=0.365).

**Conclusions:** The rate of adherence to guideline-directed EOT post-ACS was low. Therefore, opportunities exist to understand this disconnect with guideline recommendations and to optimize use of non-statin therapies in patients not meeting LDL-C goals post-ACS.
Comparison of sedation practices before and during the COVID-19 pandemic

Objective: Given the increased sedation requirements observed in patients with COVID-19, there is concern that patients admitted to an ICU without a COVID-19 infection may receive more liberal sedation than those admitted before the COVID-19 era. The aim of this study was to compare sedation use in critically ill patients without COVID-19 before and during the COVID-19 pandemic.

Methods: METHODS: This was a retrospective chart review performed at a community teaching hospital. Patients without COVID-19 admitted to an intensive care unit in 2019 (before pandemic) and 2021 (during pandemic) were included. The primary outcome was percent of days spent in deep sedation (Richmond Agitation Sedation Scale -4 or -5). Secondary outcomes included depth of sedation, sedative infusion(s) prescribed, maximum rate and duration of each sedative, ICU length of stay (LOS), and duration of mechanical ventilation.

Results: RESULTS: Of the 204 patient encounters reviewed, 42 were included for analysis (20 pre-COVID-19 and 22 during the COVID-19 era). Patients admitted before the COVID-19 pandemic spent 14.3% of sedation days in deep sedation, whereas those admitted during the pandemic spent 16.3% of sedation days in deep sedation. Patients admitted during the pandemic spent 14% fewer days in light sedation and 12% more days in moderate sedation. Sedative infusions prescribed and maximum rates were similar between groups. Patients admitted during the pandemic had a longer median ICU LOS (5 days versus 8 days) and increased ventilation time (3 days versus 6 days).

Conclusions: CONCLUSIONS: Patients admitted during the COVID-19 era were more likely to receive deeper levels of sedation and had increased ICU LOS and ventilation time. This quality improvement project illustrates how patient care can be impacted during pandemics and warrants a larger review to confirm these findings.
Evaluation of diuretic strategies in acute decompensated heart failure

Objectives: The current mainstay of therapy for patients admitted to the hospital with acute decompensated heart failure (ADHF) is loop diuretics. Patients with ADHF usually require high-dose intravenous diuretics, bumetanide or furosemide, to manage their volume overload; however, there is limited data to guide their appropriate inpatient use. Additionally, use of high-dose loop diuretics comes with a great deal of risks such as acute kidney injury, electrolyte and metabolic derangement, ototoxicity, and myalgia. The objective of this study is to evaluate the efficacy and safety of furosemide and bumetanide continuous infusions at equipotent doses (furosemide 20mg IV = bumetanide 1mg IV) in patients admitted with decompensated heart failure.

Methods: This was a single center, retrospective cohort analysis that examined critically ill patients admitted to cardiac intensive care units at MGH between 08/01/2020 and 11/30/2021 who received at least 48 hours of furosemide or bumetanide continuous infusion for acute decompensated heart failure. Patients were excluded if they received renal replacement therapy or inotropes at the time of study enrollment or switched to an alternative loop diuretic within the 72-hour period. The primary outcome of the study was diuretic response defined as a 24-hour cumulative urine output (mL). Secondary outcomes included a 24-hour net fluid balance, escalation of therapy, and adverse effects. The potency of IV bumetanide was compared with furosemide in a subset of patients with equipotent doses.

Results: 90 patients were included in data analysis, with 55 in the furosemide group and 35 in the bumetanide group with an average ejection fraction of 38%. There was no difference in 24-hour cumulative urine output between furosemide and bumetanide [4815 (3913-5448) vs. 3785 (2838-4858), p=0.08]. A net 24-hour fluid balance was significantly lower in the furosemide group compared to the bumetanide group [-1363 (-1863 -634) vs. -410 (-1302-596), p=0.03]. More patients in the bumetanide group received additional thiazide diuretics (51% vs 13%, p<0.001) and had higher incidences of severe acute kidney injuries (20% vs. 2%, p=0.003). When comparing furosemide versus bumetanide at equipotent doses in the subgroup analysis, the equivalence ratio of ml urine output per mg of drug was found to be 10:1.
Conclusions: There was no difference in 24-hour cumulative urine output between furosemide and bumetanide. More patients in the bumetanide group were started on a higher initial dose, required additional thiazide diuretics, and had severe acute kidney injury, which may be explained by a higher incidence of diuretic resistance seen in the bumetanide group.
CHAnges in diuretic Medication Prescribing after Initiating empagliflozIN (CHAMPION study)

Objectives: We aimed to describe the impact of initiating SGLT-2 inhibitors (SGLT2i) on diuretic prescribing patterns at the Salem Veterans Affairs Medical Center. Additionally, we evaluated the impact of SGLT2i on intermediate outcomes in patients with and without diuretic use at baseline.

Methods: This retrospective cohort study included patients with a prescription for empagliflozin as of July 1, 2021. Patients were assigned to the intervention group if prescribed a concomitant diuretic or the control group if not prescribed a diuretic. Baseline demographics included age, sex, race, socioeconomic status, weight, height, past medical and medication use history, and pertinent laboratory parameters. The primary outcome was the impact of initiating empagliflozin on diuretic prescribing patterns. Secondary outcomes were change in weight, A1c, eGFR, hemoglobin (Hgb), hematocrit (HCT), blood pressure, and electrolytes at 90 days after empagliflozin initiation. Descriptive statistics were used for primary outcomes. Mean differences at 90 days were compared between groups using the t-test in the unmatched and matched cohorts. Additional outcome included change in secondary outcomes at 90 days after SGLT2i initiation for all patients. Patients without diuretic use were matched in a 1:1 ratio to patients on diuretics based on propensity scores. All statistical tests were two-sided and P<0.05 was considered statistically significant.

Results: This study included 1,189 patients: 750 in the empagliflozin only group and 439 in the empagliflozin plus diuretic group. After performing propensity matching between the two groups, baseline characteristics were similar per standardized difference values. Of the 439 patients in the empagliflozin plus diuretic group, 118 had a change in their diuretic regimen. There was a total of 131 recorded changes as some patients were on multiple diuretics. Overall, there were 109 diuretic discontinuations, 13 decreases in dose, and nine increases. Among all patients, there was a decrease at 90 days in weight (232.74 vs. 227.82 lb.; P=0.01), eGFR (82.66 vs. 77.35 mL/min/1.73m3; P<0.001), and A1c (8.66 vs. 7.93%; P<0.001). There was an increase in Hgb (14.25 vs. 14.93 g/dL; P<0.001), HCT (43.12 vs. 45.68%; P<0.001), and magnesium (1.93...
In the propensity-matched cohort, weight was significantly reduced at 90 days in the intervention group compared to the control group (3.42 vs. -15.44 lb., P<0.001).

**Conclusions:** This hypothesis-generating study confirms that SGLT2i can improve hemoconcentration which should be explored in future studies. Additionally, the significant weight loss observed with SGLT2i and concomitant diuretics highlights the need for increased vigilance to prevent adverse effects.
Conference Abstracts  
May 16-18, 2022

**Presenter Name:** Harrsch, Felicia  
**Organization:** Penn Medicine Lancaster General Health  
**Category:** Cardiovascular/Critical Care  
**Day | Session | Room | Time:** Wednesday | 5 | Crystal B | 12:30:00 PM

**Authors:** FA Harrsch, K Makkar, J Walls; Penn Medicine Lancaster General Health (LGH), Lancaster, Pennsylvania

**Title:** Safety of direct oral anticoagulants compared to warfarin in patients hospitalized with acute kidney injury

**Objectives:** Direct oral anticoagulants (DOACs) have become the preferred guideline-recommended oral anticoagulants for many indications due to their non-inferior, and sometimes superior efficacy in the prevention of thrombosis and systemic embolism, improved safety profile, lack of monitoring requirements, and lower incidence of drug and food interactions. However, DOACs have not been well studied in patients with moderate to severe or end-stage renal disease (ESRD). Therefore, warfarin continues to be the drug of choice in this patient population due to its lack of renal elimination. In addition, to our knowledge, there currently are no known studies comparing the safety of DOACs and warfarin in patients hospitalized with acute kidney injury (AKI). As such, the safety of DOACs versus warfarin in this patient population remains unknown. The purpose of this study was to evaluate the bleed risk associated with DOACs compared with warfarin in patients admitted to the hospital with AKI.

**Methods:** Medical charts of patients prescribed a DOAC or warfarin prior to admission and admitted to Lancaster General Hospital (LGH) with AKI from October 2017 to September 2021 were retrospectively reviewed. Patients were included if they were at least 18 years of age, admitted to LGH with AKI, and receiving a DOAC or warfarin with an INR goal of 2-3 prior to admission. One hundred twelve patient encounters met inclusion criteria and were evaluated. The primary endpoint was the percent frequency of composite major and non-major bleeding within 30 days of discharge, including the duration of admission. Secondary endpoints included frequency of bleeding, mortality, venous thromboembolism or pulmonary embolism, and embolic stroke, as well as the action taken on the anticoagulation regimen during admission. Categorical variables will be analyzed using a chi-squared test, while continuous variables will be analyzed using a paired t test for parametric data, and a Wilcoxon matched paired test for nonparametric data. We hypothesized that patients hospitalized with AKI and who were on a DOAC prior to admission would have similar rates of bleeding as patients on warfarin prior to admission.

**Results:** To be presented at the Eastern States Conference.

**Conclusions:** It is anticipated that this research will help elucidate if DOACs are as safe as warfarin in patients hospitalized with acute kidney injury.
**Title**: Evaluation of the Treatment for Diabetic Ketoacidosis at a Community Health System in the Intensive Care Unit

**Objectives**: Diabetic ketoacidosis (DKA) is a potentially fatal hyperglycemic crisis that uses insulin as the mainstay of treatment, a narrow therapeutic index drug. A main concern with continuous insulin administration is hypoglycemia, as suggested by the NICE-SUGAR trial which demonstrated increased mortality when targeting a blood glucose of 80-110 mg/dL, when compared with <180 mg/dL. The goal of this evaluation is to assess the safety of the current DKA protocol specifically, hypoglycemia, hypokalemia, and adherence to protocol guidelines.

**Methods**: A single center retrospective review was conducted on electronic medical records (EMRs) for all adult patients admitted to the ICU across the health system between March 3rd, 2020 and September 30th, 2021. Patients with a diagnosis of DKA (blood glucose >250mg/dL, arterial pH of <7.30, bicarbonate level of <18 mEq/L, and adjusted anion gap of >10-12) and those that received intravenous insulin were included in this evaluation. The primary endpoint was the incidence of hypoglycemia (blood glucose <110mg/dl) and severe hypoglycemia (<70mg/dl). Outcome measures are reported as both incidence and as percentage of the total study population.

**Results**: Ninety-five patients were included in the study and 64% had at least one instance of hypoglycemia, with severe hypoglycemia occurring in 17% of patients. The majority of these patients, 71%, were inappropriately maintained on protocol parameters of the insulin drip after discontinuation criteria were met.

**Conclusions**: The institution's current DKA protocol in place resulted in suboptimal rates of hypoglycemia and may benefit from modifications to enhance patient outcomes. Sustained maintenance on IV insulin after anion gap closure could have contributed to increased rates of hypoglycemia and may be an area of improvement.
**Title:** Evaluating the impact of a standardized medication reconciliation process in a community hospital

**Objectives:** Medication errors are the most common patient safety issue and cause of avoidable harm in health care systems. Obtaining a comprehensive medication history and medication list through medication reconciliation may mitigate incorrect or incomplete transfer of medication information, such as potential omissions, duplications, or drug interactions, during transitions of care. However, the reconciliation process may be variable in each institution. The purpose of this study was to determine if standardization of the medication reconciliation process reduces the number of discrepancies per medication seen at admission and discharge.

**Methods:** This study is an Institutional Review Board (IRB) approved single-centered, retrospective chart review of adult patients before and after the implementation of a standardized medication reconciliation policy between September 1, 2021 and March 31, 2022. A hospital policy for medication reconciliation was created and approved by the Pharmacy, Therapeutics, and Nutrition (PT&N) and the Medical Board. Education was provided to triage nurses and physicians upon implementation. Patients aged 18 years or older, with at least one prescription medication, and admitted to the medicine service, critical service, or surgery service were identified from a pre-generated admissions list from the last 24 hours. A comprehensive chart review, including demographic information and medication history, was conducted from the electronic medical record (EMR) system. Two or more sources, such as a family member and local pharmacy, were utilized to verify medication history and create the gold standard medication list. Data variables, including discrepancy type and total number of discrepancies at admission and discharge, were compared before and after policy implementation.

**Results:** The number of discrepancies per patient, per medication, and those involving high alert medications were recorded from admission and discharge and results will be presented.

**Conclusions:** It is anticipated that this project will effectively reduce the number of medication discrepancies and improve our institution’s understanding of the medication reconciliation process.
Conference Abstracts
May 16-18, 2022

Presenter Name: HUSSAIN, Mustafa
Organization: Geisinger Medical Center
Category: Cardiovascular/Critical Care
Day | Session | Room | Time: Wednesday | 5 | Magnolia D | 12:45:00 PM

Authors: M. Hussain, D. Longyhore, N. Patel, D. Polombo, J. Gregoire; Geisinger Medical Center (GMC), Danville, Pennsylvania

Title: Adverse event reporting rates using an in-Electronic Health Record documentation tool by pharmacists

Objectives: The move to electronic reporting systems has increase adverse drug reaction capture rates, but more improvements are needed. Available research discusses electronic reporting tools outside of an electronic health record and does not address the affect of an in-Electronic Health Record tool to capture adverse drug event reporting information at the point of care. The purpose of this research is to evaluate adverse drug reaction reporting rates if information could be captured at the point-of-care using a tool within an electronic health record.

Methods: The primary observed outcome following the implementation of the point-of-care tool was the number and rate of pharmacy-reported adverse drug reactions. An intervention (i-vent) template was created in EPIC to replicate the information fields used in the Multiple Intelligences Development Assessment Scales (MIDAS+) system. The implementation tool was restricted to pharmacist staff members of Geisinger, focused on quality assurance and medication safety use. Therefore, information was based on drug information and no patient identifiers were evaluated. Only data ultimately entered into the MIDAS+ was included in the analysis. Data was analyzed using averages and percentage changes within Microsoft Excel

Results: The number and percentage of reports that changes from before and after the implementation of the i-vent tool will be recorded and results will be presented.

Conclusions: A change in the percentage of adverse drug reaction reporting rates within MIDAS is inconclusive at this time as data is still being processed.
Comparison of insulin glargine vs. NPH for glycemic control in medical ICU patients

Objectives: Glycemic control is vital in the management of medical intensive care unit (MICU) patients with a variety of insulin formulations available to consider. Given ICU patients' rapidly changing and unpredictable insulin requirements, the use of intermediate-acting insulin, such as insulin NPH, may provide improved flexibility in dose adjustments and improved glycemic control as compared to long-acting insulin glargine. The objective of this study was to compare insulin glargine vs. insulin NPH for glycemic control in MICU patients at two academic medical centers.

Methods: This retrospective cohort study included adult patients admitted to the MICU at two academic medical centers between July 1, 2019 and June 30, 2021. Patients were included if they received insulin glargine or insulin NPH during their ICU admission. Exclusion criteria included diagnosis of diabetic ketoacidosis or hyperosmolar hyperglycemic state or administration of an insulin infusion during admission. The primary endpoint was the percentage of blood glucose readings within goal range, defined as 70 â€“ 180 mg/dL. Secondary endpoints included time from insulin initiation to two consecutive blood glucose readings within goal range, percentage of blood glucose values below 70 mg/dL or above 180 mg/dL, percentage of insulin doses held, and number of dose adjustments.

Results: A total of 87 patients were included in the analysis, of which 60 patients received insulin glargine and 27 received insulin NPH. The median percentage of blood glucose readings within goal range (70 â€“ 180 mg/dL) per patient was 50% (IQR 27.5, 66.5) vs. 69.8% (IQR 48.8, 79.1) in the glargine vs. NPH groups, respectively. Median time from insulin initiation to two consecutive blood glucose readings in goal range was shorter in the insulin NPH group (32.2 [IQR 7.9, 65.3] vs. 27 [IQR 12.3, 42.1] hours). Median percentage of blood glucose values above 180 mg/dL per patient was also lower in the NPH group (47.7% [IQR 30.8, 72.5] vs. 30.2% [IQR 20.9, 50]). Median percentage of blood glucose readings below 70 mg/dL per patient was similar between the two groups (0% [IQR 0, 0] vs 0% [IQR 0, 0]).

Conclusions: Insulin NPH was associated with overall improved glycemic control and faster time to achievement of blood glucose goals as compared to insulin glargine. When designing a
subcutaneous insulin regimen for MICU patients, it may be appropriate to consider insulin NPH due to a pharmacokinetic profile more suitable to a critically ill population.
Enoxaparin Dosing in COVID ICU Patients

Nicole Jankowski, PharmD; Ashley Quintili, PharmD, BCCCP, BCPS; Kimberly Keefer, PharmD, BCCCP, BCPS; Sarah Livings, PharmD, BCCCP, BCPS

Objective: COVID-19 is associated with a prothrombotic state leading to adverse clinical outcomes. The ACTION trial is a randomized control trial that reviewed the efficacy and safety of therapeutic versus prophylactic anticoagulation in COVID positive patients. It found that patients on therapeutic anticoagulation experienced more major or clinically relevant non-major bleeding as compared to prophylactic dosing. Although this trial reviewed safety they did not mention any monitoring parameters, such as levels, used for anticoagulants. Enoxaparin is a preferred anticoagulant in COVID ICU patients with thrombosis due to ease of administration and less frequent monitoring. Anti-Xa levels are utilized to determine if enoxaparin is in its therapeutic range. Due to the complexity of these patients, unpredictable pharmacokinetics may be seen with enoxaparin. The objective for this study is to evaluate the use of enoxaparin in COVID ICU patients to assess dosing practices. The question remains if alternate dosing is necessary to decrease the risk of bleeding events.

Methods: This retrospective study included COVID positive patients admitted to an adult ICU receiving enoxaparin from March 1, 2020 to January 1, 2022. Patients were excluded if enoxaparin was discontinued prior to the first level, on renal replacement therapy, had a CrCl < 30 mL/min, level not drawn at steady state, or received ECMO. Patients were allocated to one of two comparator groups: enoxaparin dose of 0.75 mg/kg and 1 mg/kg. The primary endpoint was determining which initial enoxaparin dose, 0.75 mg/kg vs. 1 mg/kg, results in therapeutic anti-Xa levels (0.6-1 IU/mL). Secondary endpoints include bleeding rates and final therapeutic dose utilized (mg/kg).

Results: Of 98 patients evaluated, 84 patients were included in the study (n= 34 for 0.75 mg/kg group vs. n= 50 for 1 mg/kg group). The average number of initial therapeutic levels was greater in the 0.75 mg/kg group (61.9% vs. 33.3%, p=0.021). The mean final therapeutic dose was similar in the 0.75 mg/kg group, but lower in the 1 mg/kg group (0.76 mg/kg vs. 0.87 mg/kg, p=0.019). In addition, there was no difference in bleeding rates among dosing groups detected (4.8% vs. 9.5%, p=0.674).

Conclusions: At our institution, we were able to determine that adult COVID-19 ICU patients required lower initial doses of enoxaparin to reach therapeutic anti-Xa levels.
Author Name: Joan Kariuki, PharmD, Alison Sabados, PharmD, BCCCP, Joseph DiBlasi, PharmD, MBA

Title: Evaluation of albumin use and cost in a community teaching hospital

Objectives: Widespread use of albumin over crystalloids for fluid resuscitation is unsupported by literature and guidelines but is associated with high cost. This has led other institutions to implement use restrictions and cost saving strategies. At our institution, albumin is not restricted nor are there guidelines for appropriate use. The aim of this project was to determine the rate of inappropriate albumin use and associated costs at our institution.

Methods: A retrospective chart review of 236 albumin administrations in adult patients from January 1-15, 2022 was performed. Data collected for each albumin order included concentration (5 or 25%), dose (grams), indication, frequency, order set usage, location, and provider specialty. Appropriate albumin use was defined as follows: sepsis or shock after 2L bolus of crystalloid within 24 hours, cardiothoracic surgery after 2L of crystalloid within 24 hours after procedure, hemodialysis from order set, hepatorenal syndrome in cirrhosis, spontaneous bacterial peritonitis, plasmapheresis or large volume paracentesis (>4L) in cirrhosis. The primary outcome was the percent of inappropriate albumin administrations. Secondary outcomes included location, cost, and reason for inappropriate use.

Results: Of 236 albumin orders assessed, 59% were deemed inappropriate. The total cost of inappropriate albumin use was $7045 ($1761 for 5% and $5284 for 25%). The most common reasons for inappropriate use were sepsis or shock without 2L bolus of crystalloid within 24 hours (58%), diuretic resistance (24%) and cardiothoracic surgery without 2L bolus of crystalloid within 24 hours after procedure (8%).

Conclusions: The majority of albumin administrations were inappropriate, two-thirds of which were in the ICU. Most inappropriate administrations were in the setting of sepsis or shock without 2L bolus of crystalloid within 24 hours. The total cost of inappropriate administrations was approximately $7,000 in 15 days, with extrapolated cost of more than $200,000 annually.
Vasopressin Use In Septic Shock and Its Effect On Mortality

Objective: Septic shock is a life-threatening condition in which patients commonly require multiple vasoactive agents to maintain systemic perfusion. The goal of this study is to assess whether there is an association between initiation time of vasopressin as it relates to mortality. Patients initiated on vasopressin while receiving low doses of norepinephrine (<15 mcg/min) will likely have a lower mortality rate in comparison to patients initiated on vasopressin while receiving high doses of norepinephrine (>15 mcg/min).

Methods: Retrospective chart review will be performed of patients receiving vasopressin. Patients will be included in the study if they are at least 18 years of age, diagnosed with septic shock, and were initiated on norepinephrine and then vasopressin as their second vasoactive agent. Some data points to be collected include etiology of sepsis, Sequential Organ Failure Assessment score, norepinephrine dose, time from norepinephrine to vasopressin initiation and duration of vasopressors.

Results: Descriptive statistical analysis will be performed for the aforementioned data points.

Conclusions: Based on available data it is projected that the cohort of patients initiated on vasopressin early will likely have a lower mortality rate in comparison to patients initiated on vasopressin later on.
Apixaban versus enoxaparin for thromboprophylaxis in non-critically ill COVID-19 patients

**Presenter Name:** Khooblall, Natasha  
**Organization:** Montefiore Medical Center  
**Category:** Cardiovascular/Critical Care  
**Day | Session | Room | Time:** Tuesday | 4 | Empire A | 3:45:00 PM

**Authors:** N. Khooblall, N. Quinn, K. Veltri, E. Messing, M. J. Sinnett; Montefiore Medical Center, Bronx, New York

**Title:** Apixaban versus enoxaparin for thromboprophylaxis in non-critically ill COVID-19 patients

**Objectives:** Though critically ill patients are at a higher risk for thrombosis, most patients hospitalized with COVID-19 are not critically ill and do not require organ support. There have been several studies in non-critically ill patients demonstrating improved outcomes in therapeutic versus prophylactic doses of enoxaparin and others optimizing anticoagulation with apixaban due to its ease of administration, lack of monitoring, and reduced bleeding complications. We aim to evaluate the effects of apixaban, at any appropriate dose, compared to therapeutic enoxaparin in non-critically ill hospitalized COVID-19 patients for venous thromboembolism prophylaxis.

**Methods:** Adults admitted to one of three Montefiore Medical Center campuses with a confirmed COVID-19 diagnosis who were administered apixaban or therapeutic enoxaparin in combination with dexamethasone within 48 hours and remained on the anticoagulation for at least 96 hours were reviewed and followed through hospital discharge or death. Patients admitted to the intensive care unit or who required vasopressors within 96 hours of admission were excluded. Patients with contraindications to therapeutic anticoagulation, active bleeding, thrombocytopenia, mechanically ventilated or who were DNR (do not resuscitate)/DNI (do not intubate), palliative care, pregnant, or breastfeeding were also excluded.

**Results:** The differences in all-cause 30-day mortality between apixaban and enoxaparin, measures of effectiveness in thrombosis prevention, and safety in major bleeding between agents will be recorded and results will be presented.

**Conclusions:** It is anticipated that this project will demonstrate noninferiority between the effects of apixaban and therapeutic enoxaparin in non-critically ill COVID-19 patients.
Analysis of the use of empiric antimicrobial prophylaxis for temporary cardiac devices at a large academic medical center

**Objectives:** Varying rates of access site infections with temporary mechanical circulatory support (MCS) devices have been reported in the literature. No randomized studies and limited guideline recommendations exist on prophylactic antibiotics after the insertion of MCS devices. The purpose of this project is to evaluate the safety and efficacy of empiric antimicrobial prophylaxis for patients with temporary percutaneous cardiac devices and validate a new institutional protocol.

**Methods:** An institution-wide peri-procedural antimicrobial prophylaxis guideline was developed with recommendations specifically outlined for each cardiovascular procedure, including the insertion of percutaneous cardiac devices. This retrospective, single-center, pre- and post-implementation analysis examined adult patients who were admitted to the Cardiac Intensive Care Unit (ICU) or Cardiac Surgical ICU with a temporary percutaneous MCS device. The primary endpoint of this study was the incidence of definitive access site infection, defined as a positive wound culture or the presence of signs and symptoms of access site infection during the admission. The secondary endpoints included incidence of Clostridium difficile infection (CDI), multi-drug resistant organism infection, and initiation of broad-spectrum antibiotics after device insertion. Baseline characteristics were analyzed with descriptive statistics, categorical data were compared with the chi squared test, and continuous data was compared with the student's t-test, with significance defined as a p-value of ≤ 0.05.

**Results:** Of the 95 study participants, 50 were assigned to the pre-implementation cohort and 45 were assigned to the post-implementation cohort. The mean age of the participants was 67, 63% were male, and 69.5% had a history of atherosclerotic cardiovascular disease. Many of the temporary devices were represented in this population including intra-aortic balloon pump (49.5%), veno-arterial extracorporeal membrane oxygenation (27.4%), Impella® CP (15.8%), Impella® 5.5 (11.6%), transvenous pacing wire (2.1%), Impella® 5.0 (2.1%), veno-venous extracorporeal membrane oxygenation (2.1%), and ProTek® Duo right ventricular assist device (1.1%). Overall, there was a low incidence of definitive access site infection across both cohorts, with only one occurrence in the post-implementation cohort. There were no significant
differences in the primary or secondary outcomes, although there was a significant reduction in prophylactic antimicrobial utilization at device insertion in the post-implementation cohort (p <0.001).

**Conclusions:** Based on the results of our study, the implemented protocol reduces the utilization of empiric antimicrobial prophylaxis for insertion of temporary percutaneous cardiac devices and does not result in an increased rate of infections.
Objective: Optimal reversal agent for DOAC-associated major bleeding has not been described. The ANNEXA-4 study showed that excellent or good hemostasis was achieved in 82% of patients who received andexanet alfa for DOAC-associated major bleeding. Before the approval of andexanet alfa in 2018, four-factor prothrombin complex concentrate (4F-PCC) was recommended by major guidelines, such as Neurocritical Care Society and Anticoagulation Forum, as the first-line agent for DOAC-associated major bleeding. With a paucity of literature comparing the two agents, there is clinical value in assessing hemostatic efficacy and safety of the two agents in a multi-center setting.

Methods: A multi-centered, retrospective chart review was conducted. Adult patients who were admitted to any of the 5 hospitals within a single health system for a DOAC-associated major bleeding and received 4F-PCC from February 2018 to May 2019 or andexanet alfa from May 2019 to September 2021 were included. Each patient's medical management was evaluated for hemostatic efficacy and safety. The primary outcome of the study was hemostatic efficacy, defined as excellent, good, or poor. Secondary outcomes included time to administration, hospital mortality, length of stay, need for surgery, and thrombotic events.

Results: There were 84 patients included in the andexanet alfa arm and 100 patients in the 4F-PCC arm. Primary and secondary outcomes comparing the efficacy and safety of 4F-PCC and andexanet alfa will be compiled and the final results will be presented.

Conclusions: It is anticipated that this project will add to the body of evidence for place in therapy of andexanet alfa in comparison to 4F-PCC when used in the setting of DOAC-associated major bleedings.
Objective: Optimal reversal agent for direct oral anticoagulant (DOAC)-associated major bleeding has not been described. The ANNEXA-4 study demonstrated that excellent or good hemostasis effect was achieved in 82% of patients who received andexanet alfa for DOAC-associated major bleeding. Before the approval of andexanet alfa in 2018, four-factor prothrombin complex concentrate (4F-PCC) was recommended by major guidelines, such as Neurocritical Care Society and Anticoagulation Forum, as the first-line agent for DOAC-associated major bleeding. With a paucity of literature comparing the two agents, there is clinical value in assessing hemostatic efficacy and safety of the two agents.

Methods: A multi-centered, retrospective chart review was performed of adult patients who were admitted for a DOAC-associated major bleeding and received 4F-PCC from February 2018 to May 2019 or andexanet alfa from May 2019 to September 2021. Exclusion criteria included patients who did not receive apixaban or rivaroxaban, received multiple reversal agents during the same hospitalization, received reversal for any non-major bleeding indication, received a massive transfusion, or were transferred from an outside facility. The primary outcome of the study was hemostatic efficacy, defined as excellent, good, or poor. Secondary outcomes included time to administration, hospital mortality, length of stay, need for surgery, need for additional blood products, and safety outcomes include evaluation of thrombotic events.

Results: Primary and secondary outcomes comparing the efficacy and safety of 4F-PCC and andexanet alfa will be compiled and the results will be presented.

Conclusions: It is anticipated that this project will add to the body of evidence for place in therapy of andexanet alfa in comparison to 4F-PCC when used in the setting of DOAC-associated major bleedings.
Presenter Name: Kratz, Brooke  
Organization: Hospital of the University of Pennsylvania  
Category: Cardiovascular/Critical Care  
Day | Session | Room | Time: Monday | 1 | Crystal B | 1:30:00 PM

Authors: Brooke W. Kratz, PharmD, Vanessa Prendergast, PharmD, BCPS, BCCCP, Zareena Chughtai, PharmD, Christopher Domenico, PharmD, Justin Harris, PharmD, BCPS, BCCP, AACC, Michael Ruggero PharmD, BCPS, BCCCP, BCIDP  
Title: Four-factor prothrombin complex concentrate for coagulopathy following aortic surgery  
Objectives: Aortic surgeries carry a high risk of bleeding complications and transfusion requirements due to perioperative consumption of coagulation factors. Management of perioperative coagulopathy with the off-label use of four-factor prothrombin complex concentrate (4F-PCC) has been studied in the general cardiac surgery population, where aortic surgery is underrepresented. The purpose of this retrospective review is to evaluate the efficacy and safety of 4F-PCC during aortic surgery at two large academic medical centers.  
Methods: This multi-centered, single health system retrospective study included patients undergoing aortic surgery from January 1, 2019 to July 31, 2021 who received 4F-PCC for coagulopathy intraoperatively or within 6 hours after surgery. Patients who received a direct-acting oral anticoagulant or warfarin five days prior to surgery were excluded. The primary outcome of severe bleeding was a composite endpoint of incidence of reoperation for bleeding complications, chest tube output greater than one liter within 12 hours after surgery or receipt of red blood cells (RBC) and fresh frozen plasma (FFP) greater than or equal to 5 units within 24 hours after surgery. Secondary endpoints included the amount of hemostatic medications and blood products administered during and after surgery, and incidence of thromboembolic events and renal dysfunction.  
Results: A total of 146 patients were included in the study. The majority of surgeries involved the ascending aorta (90.4%) and 41.8% were redo sternotomies. The median [IQR] dose of 4F-PCC used in the study was 16 [13-25] units/kg. The composite primary endpoint of severe bleeding occurred in 49 (33.6%) patients. Reoperation occurred in 35 (24.0%) patients and 37 (25.3%) patients had greater than one liter of chest tube output within 12 hours after surgery. Within 24 hours of surgery, at least 5 units of FFP and RBC were administered to 19 (13.0%) and 18 (12.3%) patients, respectively. Thromboembolic events occurred in 15 (10.3%) patients and renal dysfunction occurred in 38 (26.0%) patients.  
Conclusions: Overall the incidence of severe bleeding remained relatively high despite intraoperative 4F-PCC administration potentially reflecting the inherent complexity and acuity of aortic surgery. However, the lack of a comparator group limits the ability to assess if 4F-PCC
had an impact on the incidence of bleeding. Subsequent evaluation with a matched cohort study is necessary to further assess the efficacy and safety of 4F-PCC in the management of post-operative hemorrhage in aortic surgery.
**Effect of guideline directed medical therapy on clinical outcomes in patients with heart failure with reduced ejection fraction post-coronary artery bypass grafting**

**Objectives:** The purpose of this study is to determine if optimal utilization of guideline directed medical therapy (GDMT) for heart failure with reduced ejection fraction (HFrEF) after coronary artery bypass grafting (CABG) decreases the total number of heart failure (HF) events in patients with HFrEF.

**Methods:** This single center, retrospective study was conducted in adult patients with a left ventricular ejection fraction (LVEF) of ≤40% prior to CABG who underwent CABG between January 1st, 2017- August 31, 2021. The primary outcome was the total number of HF events (defined as either hospitalization for HF or an unscheduled ED, PCP, heart failure clinic, or urgent care visit for heart failure that doesn't require hospitalization) at 1 month, 6 months, and 1-year post-CABG. The secondary outcomes included cardiovascular (CV) death at 1 month, 6 months, and 1-year post-CABG, all-cause mortality at each time point, LVEF at 3 months and 1 year, percent of patients on optimal HFrEF GDMT at 1 week, 1 month, 6 months, and 1-year post-CABG, percent of patients on target doses of HFrEF GDMT at each time point. Patients were separated into two cohorts. Cohort 1 consisted of 0-2 GDMT agents at 1-year post-CABG and Cohort 2 consisted of three GDMT agents at 1-year post-CABG. Results were analyzed using basic descriptive statistics and the student's t-test function.

**Results:** A total 50 patients were included in this preliminary analysis (27 patients in cohort 1 and 23 in cohort 2). The number of HF events in cohort 1 was 3, 10, and 15 at 1 month, 6 months, and 1-year post-CABG, respectively and the number of HF events in cohort 2 was 3, 5, and 6 at 1 month, 6 months, and 1-year post-CABG, respectively (P=0.1553). There was 1 CV death in cohort 1 and 0 CV deaths in cohort 2 and 1 all-cause death in cohort 1 and 1 all-cause death in cohort 2 (P=0.3247). Mean LVEF was 33% (SD Â± 11) in cohort 1 at 3 months, 35% (SD Â± 12) in cohort 2 at 3 months, 33% (SD Â± 13) in cohort 1 at 1 year, and 38% (SD Â± 15) in cohort 2 at 1 year. Most patients were receiving zero GDMT agents prior to CABG, but by the first month post-CABG, 44% of patients were on all three GDMT agents. At 1 year after CABG, 46% of patients were on all three GDMT agents. No patients were on target beta-blocker doses at 1 year, and only 28% and 30% of patients were on target angiotensin converting enzyme inhibitors.
inhibitor, angiotensin receptor blocker, or angiotensin receptor blocker/neprilysin inhibitors, and 
mineralocorticoid receptor antagonist doses, respectively.

Conclusions: Optimal GDMT for HFrEF after CABG showed numerically decreased HF events 
and CV mortality although this did not reach statistical significance. Inclusion of more patients in 
warranted to further elucidate the benefit of HFrEF GDMT in this population. GDMT regimens 
are not adequately optimized in patients with HFrEF who undergo CABG. Further 
interdisciplinary collaboration is needed to improve GDMT prescription and dose optimization to 
ensure optimal outcomes in these patients.
Conference Abstracts
May 16-18, 2022

Presenter Name: Latawiec, Veronika
Organization: Saint Francis Hospital and Medical Center
Category: Cardiovascular/Critical Care
Day | Session | Room | Time: Tuesday | 4 | Empire A | 3:30:00 PM

Authors: V. Latawiec, C. Gosalia, J. Lee, J. Barrack, M. Byram

Title: Incidence of potentially inappropriate direct oral anticoagulant prescribing during the transition of care process

Objectives: Direct oral anticoagulants (DOACs) provide an alternative therapeutic option to warfarin with fewer drug interactions and no routine efficacy monitoring. However, inappropriate use of DOACs is common and has the potential to result in adverse events such as bleeding or thrombosis. DOACs may be inappropriately prescribed for off-label indications or at incorrect doses. The objective of this study was to identify patterns of inappropriate prescribing of DOACs at our institution during the transition of care process with the goal of identifying targeted areas for intervention.

Methods: A retrospective chart review was performed including 150 prescriptions for patients discharged from Saint Francis Hospital and Medical Center between January 1, 2019 and December 31, 2019. DOAC prescriptions included for analysis were dabigatran, apixaban, rivaroxaban or edoxaban for any indication. The primary outcome was the percentage of inappropriate DOAC prescriptions at hospital discharge. DOAC prescribing was considered potentially inappropriate based upon pre-defined factors from FDA-approved prescribing information and current clinical guidelines. Secondary outcomes included the incidence of hospital readmissions or emergency department visits during the 30-day discharge period for minor or major bleeding and thrombotic events.

Results: After analysis, 30.6% (n = 46) of DOAC prescriptions were inappropriately prescribed. Of those prescriptions, 45.7% (n = 21) were classified as absolutely contraindicated and 54.3% (n = 25) were relatively contraindicated. The highest incidence of inappropriate prescribing was with inappropriate dosing. The service lines of orthopedics and cardiology had the highest incidence of inappropriate prescribing and were identified as areas for intervention. There were no occurrences of thrombosis and five occurrences of bleeding. Bleeding events were determined to be unrelated to inappropriate prescribing.

Conclusions: This study showed that there were a significant number of new DOAC prescriptions that were inappropriately prescribed based on absolute and relative contraindications. Pharmacist and unit-based prescriber education on appropriate use of DOACs is warranted to reduce the potential for adverse events.
Authors: Yeji Lee, PharmD, Gary Thompson, RPh, Ralph Riello, PharmD, BCPS, Eileen Deptula, RPh

Title: Implementation of Minnesota Detoxification Scales protocol for severe alcohol withdrawal syndrome management in an intensive care unit at a community teaching hospital

Objectives: Patients with alcohol use disorder (AUD) are at a high risk of developing withdrawal-associated seizures upon abrupt discontinuation, requiring admission to intensive care unit (ICU) for frequent monitoring. Currently, American Society of Addiction Medicine (ASAM) guidelines recommend use of a symptom-driven assessment such as Minnesota Detoxification Scales (MINDS) over a patient-reliant scoring tool such as Clinical Institute Withdrawal Assessment (CIWA) in AUD patients with delirium in ICU settings. However, comparative data on utilization of MINDS and CIWA in critically ill patients remains limited. The objective of this review is to evaluate the impact of MINDS protocol implementation on critical care outcomes and total benzodiazepine burden for the management of severe alcohol withdrawal patients admitted to the ICU of Waterbury Hospital.

Methods: A single-centered retrospective pre-post review was conducted from November 2020 to April 2021 at a community teaching hospital. In this study, patients above age of 18 with a documented diagnosis of acute alcohol withdrawal and utilization of an alcohol withdrawal assessment tool were included. Patients without ICU admission or patients with delayed ICU admission (> 72 hours after decision to admit) were excluded. Other exclusion criteria include contraindication to benzodiazepines or other standard supportive therapy such as IV fluids and thiamine. For patients with multiple admissions, medical record of each visit was reviewed as a separate data point. All visits were divided into two subgroups based on timing of implementation of MINDS protocol for alcohol withdrawal as pre-MINDS and MINDS groups. Primary outcomes include length of ICU stay, length of entire hospital stay, total amount of benzodiazepine used, and number of days on mechanical ventilation. For secondary outcomes, adherence rate to the MINDS protocol and comorbidities that may complicate the use of benzodiazepine or ventilation (i.e. COVID-19 infections) were evaluated. This project is an IRB exempt study.

Results: Length of ICU stay, length of entire hospital stay, total amount of benzodiazepine used, and number of days on mechanical ventilation will be recorded and results will be presented.
Conclusions: It is anticipated that the results of this study will provide further guidance on the utilization of MINDS protocol for management of severe alcohol withdrawal in ICU settings.
**Title:** Assessing Appropriateness of Heparin Induced Thrombocytopenia Testing and Management in Two Community Hospitals

**Objectives:** Heparin-induced thrombocytopenia (HIT) is a complication of heparin exposure with autoantibody production that can lead to severe thrombosis and death. However, studies have shown its incidence to be less than 5% and excessive testing can lead to unnecessary costs, especially in patients with low risk. Scores such as the 4Ts score have been produced to assess HIT risk. Per the American Society of Hematology, testing is not necessary for 4Ts score ≤ 3 and heparin therapy can be continued. The purpose of this retrospective chart review is to evaluate the ordering of heparin induced thrombocytopenia testing and its management in relation to 4Ts score at two community hospitals.

**Methods:** A retrospective chart review was performed for patients with heparin-induced platelet antibody tests and serotonin-release assays ordered at two community hospitals between October 2020 and March 2021. The primary endpoints include percentage of heparin-induced platelet antibody tests ordered for 4Ts score ≥ 3. Secondary endpoints include the proportion of patients in which heparin was discontinued, had alternative anticoagulants initiated, and had tests reordered. Subgroup analyses were performed by 4T score, unit (ICU versus non-ICU), and prophylactic versus therapeutic dosing.

**Results:** A total of 105 patients were included. Overall, 94.3% (100) of PF4 tests and 90.5% (38) of SRA tests were found to be negative. 52.4% (55) of PF4 tests were ordered for patients with 4Ts score ≥ 3, costing a total of $6754, and only one result was indeterminate with a negative SRA. The 1.8% (2) of patients with positive PF4 and SRA both had 4T scores of > 3, were on therapeutic heparin, and had heparin discontinued with no alternative anticoagulant. No patients had new-onset thrombosis after initiation of heparin. Heparin was discontinued in 81.0% (85) of patients. Alternative anticoagulants such as fondaparinux and argatroban were ordered in 4.8% (5) of patients, none of which had positive PF4 or SRA tests. 9.5% (10) of patients also had tests reordered within the same admission. In all cases, regardless of time between testing and if new heparin therapy was initiated, all tests were negative. 2.8% (3) of patients also had tests ordered but were not on heparin therapy.
Conclusions: These results reinforce the negative predictive value of 4Ts score < 3 in assessing risk for heparin-induced thrombocytopenia. Clinical decision support alerts should be implemented to recommend that providers calculate a 4Ts score and consider other factors for thrombocytopenia such as sepsis and septic shock, and whether patients are on therapeutic dosing prior to ordering tests.
**Conference Abstracts**  
May 16-18, 2022

**Presenter Name:** Luong, Uyen  
**Organization:** Martinsburg Veterans Affairs Medical Center  
**Category:** Cardiovascular/Critical Care  
**Day | Session | Room | Time:** Monday | 2 | Empire A | 3:30:00 PM

**Authors:** Uyen Luong, PharmD; Susan Asmussen, PharmD, BCPS

**Title:** Evaluation of exposure to selective serotonin reuptake inhibitors and the development of myocardial infarction or cerebrovascular accident

**Objectives:** The aims of this study are to demonstrate the potential cardioprotective properties of selective serotonin reuptake inhibitors (SSRIs) by evaluating the subsequent incidence of cardiac events, specifically myocardial infarction (MI) and cerebrovascular accidents (CVA) after SSRI exposure, and analyze which, if any, of the SSRIs, and at what dose(s), yields the most cardiovascular benefit through prevention of MIs and CVAs at the Martinsburg Veterans Affairs Medical Center (MVAMC).

**Methods:** This single-center, retrospective chart review (of the following data: age, sex, race, BMI, medication lists, smoking status, and alcohol use) will include Veterans who have been prescribed a SSRI prior to the cardiac event during the period of June 2011 through June 2021. This cohort will be compared to a control group of patients who have similar baseline characteristics who do not have a SSRI on their medication list prior to the cardiac event from June 2011 through June 2021. The primary endpoint for this study will be the number of patients who developed a cardiac event in the presence of an SSRI; secondary endpoints will include which SSRI led to most/least number of cardiac events and what dose of each SSRI yielded the most/least number of events.

**Results:** Institutional Review Board (IRB) and Research & Development Committee (R&DC) approval granted. Results are pending completion of project. Patient demographics and exposure to SSRI(s) and/or cardiac event(s) will be recorded and presented.

**Conclusions:** It is anticipated that this project will demonstrate a potential benefit or harm for developing a cardiac event in patients who are currently taking SSRls.
Presenter Name: Magoon, Carly  
Organization: Elliot Health System  
Category: Cardiovascular/Critical Care  
Day | Session | Room | Time: Tuesday | 3 | Empire A | 12:15:00 PM

Authors: Carly Magoon, PharmD; Laura Truhlar, PharmD, BCCCP

Title: Evaluation of an adult diabetic ketoacidosis insulin drip adjustment protocol

Objectives: The adult DKA protocol at Elliot Hospital specifies how to adjust an intravenous insulin drip according to blood glucose readings and when to discontinue the drip and transition to subcutaneous insulin. Occurrences of anion gap reopening after insulin drip discontinuation or dose reduction per protocol have been reported by nurses and physicians at Elliot Hospital. The primary objective of this study is to identify occurrences of anion gap reopening to determine and implement necessary changes to the insulin drip adjustment protocol to improve patient outcomes. Secondary objectives include protocol deviations and ICU length of stay.

Methods: Data from this retrospective cohort study will include a pre-implementation chart review of adult patients hospitalized for DKA from September 1st, 2020 to December 1st, 2021. The protocol was updated and an educational intervention was provided to physicians, nurses, and pharmacists in February 2022. The protocol will be re-evaluated through retrospective chart review from February 15th, 2022 to April 1st, 2022 to assess the effectiveness of the protocol adjustments and education.

Results: Protocol deviations occurred in 76% of patients and the average ICU length of stay was 32.5 hours. There were no instances of anion gap re-opening. The post-implementation data will be collected and presented to determine effectiveness of protocol adjustments on the rate of protocol deviations and length of stay.

Conclusions: It is anticipated that the adjustments made to the protocol will reduce the number of protocol deviations by nursing and ICU length of stay.
Conference Abstracts  
May 16-18, 2022

Presenter Name: Matthews, Garret  
Organization: The Johns Hopkins Hospital  
Category: Cardiovascular/Critical Care  
Day | Session | Room | Time: Poster

Authors: Garret Matthews, Traci Grucz, Jessica Crow, John Lindsley, Annette Rowden, Salia Farrokh, Henry Yeh, Adam Sapirstein, David Sugrue; The Johns Hopkins Hospital Health System, Baltimore, MD

Title: Outcomes associated with high-dose norepinephrine at an academic medical center

Objectives: Maximal vasopressor dosing is driven by institutional policy and may vary between intensive care units (ICUs) within an institution. The purpose of this project was to characterize use of and evaluate outcomes associated with high-dose norepinephrine (≥ 1 mcg/kg/min).

Methods: This was a retrospective, observational cohort study of adult ICU patients at two academic medical centers over five years. Patients who received high-dose for ≥ 1 hour were included. Subsequent hospitalizations were excluded. Index ICU admission was defined as the ICU admission in which patients first received high-dose norepinephrine.

Results: Among 1564 included patients, 277 (17.7%) survived to hospital discharge. The majority of patients were male (58.4%) and were admitted to a medicine unit. The median (IQR) age was 63 (53-76) years and the median (IQR) weight was 81.5 (67.1-99.3) kilograms. The median (IQR) length of stay for hospital admission and index ICU admission were 7.1 (1.8-18.1) days and 3.5 (1-10) days, respectively. Patients received high-dose norepinephrine for a median (IQR) duration of 6.3 (3-15.9) hours with a median (IQR) maximum norepinephrine dose of 3 (1.6-3) mcg/kg/min. Patients who survived to hospital discharge had a lower median (IQR) age as compared to non-survivors [58 (48-68) vs. 65 (55-74) years, p < 0.0001] and had a lower median (IQR) weight [72.8 (59.8-90.7) vs. 83.3 (68.8-100.8) kilograms, p < 0.0001]. Survivors also received high-dose norepinephrine for a shorter median (IQR) duration [4.7 (2-13.0) vs. 6.6 (1.8-16.9) hours, p < 0.0001]. The median (IQR) maximum norepinephrine dose also differed between groups, with survivors requiring lower median maximum doses [1.8 (1.4-3) vs. 3 (2-3) mcg/kg/min, p < 0.0001].

Conclusions: While unmeasured confounding factors may have impacted our findings, patients who survived to discharge received shorter durations of high-dose norepinephrine at lower maximum doses. A multivariable logistic regression will be used to identify patient characteristics associated with survival.
Presenter Name: Miele, Scott  
Organization: Saint Peter's University Hospital  
Category: Cardiovascular/Critical Care  
Day | Session | Room | Time: Tuesday | 3 | Crystal B | 1:15:00 PM

Authors: S. Miele, M. Cardinale-King; Saint Peter's University Hospital (SPUH), New Brunswick, New Jersey

Title: Evaluation of the appropriateness of the loading dose of digoxin for atrial fibrillation in patients with acute kidney injury or on dialysis at an acute care teaching hospital

Objectives: The purpose of this study is to evaluate and assess prescribing practices of digoxin loading doses in patients with acute kidney injury (AKI) or on dialysis and atrial fibrillation with rapid ventricular response (RVR).

Methods: Drug utilization reports provided by the electronic medical record (EMR) of patients admitted to SPUH who received digoxin in a two-year period were reviewed. This study included all patients with AKI, defined by the RIFLE criteria as renal injury and worse, who received a digoxin loading dose and received a serum digoxin level at least 6 hours but no more than 72 hours post-loading dose. This study will exclude any subject under the age of 18 years and on any medication with a severe interaction with digoxin.

Results: The total digoxin loading dose, serum digoxin level, evident digoxin toxicities, and effectiveness will be recorded, and results will be presented.

Conclusions: It is anticipated that this project will show the effectiveness and safety of the prescribing practices of digoxin for loading patients with AKI or on dialysis and atrial fibrillation with rapid ventricular response.
**Presenter Name:** Moore, Anderson  
**Organization:** Reston Hospital Center  
**Category:** Cardiovascular/Critical Care  
**Day | Session | Room | Time:** Tuesday | 3 | Empire A | 1:15:00 PM

**Authors:** Anderson Moore

**Title:** Evaluation of the Prescribing and Monitoring of Vasopressin within HCA Reston Hospital Center

**Objectives:** The objective of this medication use evaluation (MUE) is to assess vasopressin utilization as adjunctive treatment for norepinephrine in septic and circulatory shock at Reston Hospital Center (RHC). This is an effort is to ensure safe, cost-effective, and appropriate use of vasopressin based on current literature and practice guidelines.

**Methods:** The objective of this medication use evaluation (MUE) is to assess vasopressin utilization as adjunctive treatment for norepinephrine in septic and circulatory shock at Reston Hospital Center (RHC). This is an effort is to ensure safe, cost-effective, and appropriate use of vasopressin based on current literature and practice guidelines.

**Results:** This retrospective study included a sample size of 63 patients admitted to the ICU at RHC. For primary outcomes, 25% (n=16) of the patients were started on vasopressin concurrently with norepinephrine at a rate of 5-15 mcg/min, whereas the majority (n=26) of patients were started on vasopressin concurrently with norepinephrine dosed between 30-39 mcg/min. 57.8% (n= 37) of patients were started on vasopressin at 0.04 units/min whereas 39% (n= 25) of patients were started at 0.03 units/min. 60.9% (n=39) of patients did not complete the study due to a composite of death (n=32), comfort care (n=6), or transfer to another facility (n=1). Vasopressin was discontinued once norepinephrine reached approximately 37.1% (Â± 11.45) of its initial dose. The order of vasopressor weaning showed 92% discontinuation of vasopressin prior to epinephrine or phenylephrine. For secondary outcomes, 35% (n=23) of patients were started on either a phenylephrine (n=13) or epinephrine drip (n=10) after vasopressin was initiated.

**Conclusions:** In conclusion, vasopressin was primarily started at doses of norepinephrine between 30-39 mcg/min and discontinued at one-third of the dose at which norepinephrine was started. Less than half of the patients were started on vasopressin with norepinephrine dosed at 5-15 mcg/min. This conflicts with current literature observing mortality benefit in vasopressin in this patient population. Overall, vasopressin was appropriately discontinued prior to other vasopressors in over 92% of the surviving patients which is in accordance with current guidance. However, the majority of patients in this study were started at vasopressin 0.04 units/min instead of 0.03units/min. This indicates an opportunity for clinician education and
order set adjudication. Limitations to this study include the small patient sample (n=64) and large sum of patients who suffered from mortality prior to vasopressin discontinuation. These findings also present an implication for future studies, including a comparative study between norepinephrine monotherapy and norepinephrine combination therapy with vasopressin in order to observe additional clinical endpoints such as the mean arterial pressure.
**Conference Abstracts**  
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**Presenter Name**: Moore, Anderson  
**Organization**: Reston Hospital Center  
**Category**: Cardiovascular/Critical Care  
**Day | Session | Room | Time**: Tuesday | 3 | Empire A | 1:15:00 PM

**Authors**: Anderson Moore

**Title**: Evaluation of the Prescribing and Monitoring of Vasopressin within HCA Reston Hospital Center

**Objectives**: The objective of this medication use evaluation (MUE) is to assess vasopressin utilization as adjunctive treatment for norepinephrine in septic and circulatory shock at Reston Hospital Center (RHC). This is an effort is to ensure safe, cost-effective, and appropriate use of vasopressin based on current literature and practice guidelines.

**Methods**: This is a retrospective MUE including patients with circulatory or septic shock who received vasopressin therapy from January to June 2021 in the intensive care unit (ICU) at RHC. A retrospective review on the patient chart will be performed to determine the trends for vasopressin use. Primary endpoints include the dose of norepinephrine at which vasopressin is started and discontinued, dose of vasopressin, and the order of vasopressor weaning. Secondary endpoints include concomitant vasopressor use with phenylephrine or epinephrine. Data collection will be performed using descriptive statistical analysis and outcomes will be analyzed for areas of improvement.

**Results**: This retrospective study included a sample size of 63 patients admitted to the ICU at RHC. For primary outcomes, 25% (n=16) of the patients were started on vasopressin concurrently with norepinephrine at a rate of 5-15 mcg/min, whereas the majority (n=26) of patients were started on vasopressin concurrently with norepinephrine dosed between 30-39 mcg/min. 57.8% (n= 37) of patients were started on vasopressin at 0.04 units/min whereas 39% (n= 25) of patients were started at 0.03 units/min. 60.9% (n=39) of patients did not complete the study due to a composite of death (n=32), comfort care (n=6), or transfer to another facility (n=1). Vasopressin was discontinued once norepinephrine reached approximately 37.1% (± 11.45) of its initial dose. The order of vasopressor weaning showed 92% discontinuation of vasopressin prior to epinephrine or phenylephrine. For secondary outcomes, 35% (n=23) of patients were started on either a phenylephrine (n=13) or epinephrine drip (n=10) after vasopressin was initiated.

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May 16-18, 2022

Presenter Name: Mosseri, Eli
Organization: NYU Langone Hospital â€“ Brooklyn
Category: Cardiovascular/Critical Care
Day | Session | Room | Time: Wednesday | 5 | Empire A | 1:30:00 PM

Authors: Eli Mosseri, Pharm.D., Britta Kumley, MD, Ola Elnadoury, Pharm.D.

Title: Effect of high-dose thiamine injection on shock reversal in septic patients

Objectives: Thiamine is a co-factor for pyruvate dehydrogenase, which is an enzyme necessary for pyruvate entry into the Krebs cycle. Without this enzyme, pyruvate will be converted into lactate. Elevated lactate, which is often used as a marker of perfusion, is proportionally associated with increased mortality in septic shock. There are a few conflicting publications on the benefit of thiamine in septic shock, therefore, this study aims to ascertain if there is benefit to adding thiamine to standard of care in the management of septic shock.

Methods: This is an IRB-approved, single-center, retrospective chart review from August 2016 through December 2021. Inclusion criteria were adult patients admitted to the ICU for septic shock and receiving at least 400 mg a day of IV thiamine (given as 200 mg twice daily). Patients were excluded if they were less than the age of 18, were pregnant, admitted for SARS-COV-2, or received less than 400 mg of thiamine daily. Two matched cohorts will be evaluated, those who received high dose thiamine, and those who did not. The primary endpoint is time to shock reversal, which is defined as being off vasopressors for at least 12 hours and alive.

Results: The time to shock reversal as well as secondary endpoints will be recorded and the results will be presented.

Conclusions: It is anticipated that the addition of thiamine to standard of care will decrease time to shock reversal.
Evaluation of conversion between oral P2Y12 inhibitors in patients with acute coronary syndrome treated with percutaneous coronary intervention and stenting

**Presenter Name:** Murray, Frances  
**Organization:** Dartmouth-Hitchcock Medical Center  
**Category:** Cardiovascular/Critical Care  
**Day | Session | Room | Time:** Monday | 1 | Crystal B | 1:00:00 PM

**Authors:** Frances Murray BS, PharmD; Brian Lopez PharmD, BCCP

**Title:** Evaluation of conversion between oral P2Y12 inhibitors in patients with acute coronary syndrome treated with percutaneous coronary intervention and stenting

**Objectives:** Conversion between oral P2Y12 inhibitors in patients with acute coronary syndrome (ACS) treated with stenting may be warranted due to bleeding risk, high risk of thrombosis, use of interacting medications, and issues with cost or insurance coverage. Current recommendations for switching between P2Y12 inhibitors are based on pharmacodynamic studies and expert opinion. The primary objective of this project is to evaluate appropriateness of how oral P2Y12 inhibitors are converted including: (1) administration of an appropriate dose and; (2) timing between doses of different P2Y12 inhibitors.

**Methods:** Patients aged 18 years or older presenting to Dartmouth-Hitchcock Medical Center between January 1, 2021 and June 30, 2021 with ACS treated with PCI and stenting who converted P2Y12 inhibitors were evaluated. Demographic information including age, sex, comorbidities, ACS type and concomitant anticoagulant and antiplatelet use was collected. Initial P2Y12 agent and dose, converted P2Y12 agent and dose, time of administration between oral P2Y12 inhibitors and reason for switching P2Y12 inhibitors was collected to assess appropriateness of how P2Y12 inhibitors are converted. Information was obtained through retrospective chart review.

**Results:** Percent of patients given an appropriate dose and median time between P2Y12 inhibitors will determined and these results will be presented.

**Conclusions:** It is anticipated that this project will demonstrate wide variability in practice among providers. The long term aim of this project is to improve adherence to expert consensus on converting P2Y12 inhibitors.
Total Chloride Load and Association with Hyperchloremic Metabolic Acidosis and Time to Resolution of Diabetic Ketoacidosis

**Objectives:** Current practice guidelines recommend normal saline for fluid resuscitation in patients with diabetic ketoacidosis (DKA). Patients with DKA often develop hyperchloremic metabolic acidosis (HMA). HMA results from the urinary loss of ketones, which are bicarbonate precursors and from chloride retention. Balanced crystalloids, such as Plasmalyte and Lactated Ringers are hypothesized to prevent the development of HMA given their lower chloride content. By preventing HMA, this is believed to ultimately decrease the time to recovery of DKA. However, current primary literature provides conflicting results when comparing normal saline to other balanced crystalloid solutions. The objective of this study is to determine if the amount of chloride a patient receives is associated with the development of HMA and the time to recovery of DKA.

**Methods:** A retrospective cohort study was conducted using electronic medical record data for patients admitted with a diagnosis code of DKA from 1/1/2020 through 12/31/2021. Patients who were under age 18, had a creatine clearance less than 30 mL/min per Cockcroft-Gault, or received bicarbonate were excluded. The primary endpoint was the total chloride load received until resolution of DKA. Resolution of DKA was defined as a blood glucose < 200 mg/dL, a bicarbonate of ≥ 15 mEq/L, and an anion gap ≤ 12 mEq/L. For all patients, the volume of fluid received, the composition, and the dose of any oral chloride containing products were noted until resolution of DKA. Secondary endpoints included the development of HMA, time to resolution of DKA, and length of stay.

**Results:** To be presented.

**Conclusions:** To be presented.
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Presenter Name: Neville, Megan
Organization: Geisinger Wyoming Valley Medical Center
Category: Cardiovascular/Critical Care
Day | Session | Room | Time: Wednesday | 5 | Empire A | 1:00:00 PM

Authors: Megan Neville, PharmD, Laura Brickett, PharmD, BCCCP, Kristen Lopatofsky, PharmD, BCCCP

Title: Impact of obesity on hemodynamics in critically ill patients receiving propofol

Objectives: Propofol is a commonly used sedative in the ICU but data on optimal dosing in obese patients is lacking. As propofol is a lipophilic medication, a relatively higher dose based on actual body weight may lead to accumulation and increase risks of adverse events. The purpose of this research project is to evaluate the rate of hypotension and/or bradycardia in critically ill patients receiving propofol for sedation.

Methods: This single center, retrospective cohort study examined mechanically ventilated, adult patients receiving continuous sedation with propofol in the intensive care unit from 08/01/2016 to 08/01/21. Patients were excluded if they met any of the following criteria: propofol dosing not based on actual body weight, on vasopressors at time of initiation, received a bolus dose of propofol, received propofol for less than 4 hours, had history of heart block or a permanent pacemaker, or admitted to a cardiology service. Data was obtained from a data broker and manual chart review was utilized to validate missing variables to compare outcomes for obese and non-obese cohorts.

Results: The primary outcome will be reported as the percent of hemodynamic instability during the first 72 hours of propofol administration, defined as hypotension (systolic blood pressure < 90 mmHg or MAP < 65 mmHg) and bradycardia (heart rate < 60 bpm).

Conclusions: It is anticipated that this project will demonstrate increased risk of hypotension and bradycardia in obese patients.
**Presenter Name:** Odigbo, Ngozika  
**Organization:** University of Maryland Capital Region Medical Center  
**Category:** Cardiovascular/Critical Care  
**Day | Session | Room | Time:** Monday | 2 | Crystal B | 3:30:00 PM

**Authors:** Ngozika Odigbo, PharmD, Pan Pan Wong PharmD, MSEd, BCCCP  
**Title:** Evaluation of venous thromboembolism prophylaxis in trauma patients  

**Objectives:** Venous thromboembolisms (VTE) is a common complication in trauma patients due to many factors such as hypercoagulability and prolonged immobility. VTE can lead to an increased risk of morbidity and mortality, thus prophylaxis is essential for the management of these patients. Mechanical and pharmacological prophylaxis can be utilized in trauma patients to reduce their risk of developing a VTE. The purpose of this study is to investigate safety and efficacy of VTE prophylaxis strategies in a trauma patient population.

**Methods:** This observational, retrospective, single-centered study will be conducted between July to August 2021. Patients will be included if they were admitted into the trauma intensive care unit and are 18 years or older. Patients will be excluded if they are receiving treatment dose anticoagulation, if they are concurrently on dual antiplatelet therapy, or if they are on direct oral anticoagulants. The primary outcome is the occurrence of VTE events such as deep vein thrombosis or pulmonary embolism. Secondary outcomes include documented bleeding events and length of stay. This study will be submitted to the Institutional Review Board for approval.

**Results:** The number and percentage of patients that developed either a deep vein thrombosis, a pulmonary embolism or had a bleeding event will be recorded and results will be presented.

**Conclusions:** It is anticipated that this project will demonstrate how the use of venous thromboembolism prophylaxis affects a trauma patient population.
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**Presenter Name:** O'Donnell, Bridget  
**Organization:** Lahey Hospital and Medical Center, Burlington, Massachusetts  
**Category:** Cardiovascular/Critical Care  
**Day | Session | Room | Time:** Tuesday | 4 | Crystal B | 2:45:00 PM

**Authors:** B. O'Donnell, P. Grgurich, E. Hillel, K. Nault  
**Title:** Evaluation of sedative medication use in mechanically ventilated patients within an academic medical center

**Objectives:** Deep sedation in mechanically ventilated patients has been associated with poor outcomes such as increased length of stay and delirium. The 2018 Clinical Practice Guidelines for the Prevention and Management of Pain, Agitation/Sedation, Delirium, Immobility, and Sleep Disruption (PADIS) in Adult Patients in the Intensive Care Unit (ICU) recommend light sedation in mechanically ventilated patients. This study will evaluate average doses of sedative and analgesic agents for ventilated patients in surgical, cardiac, and medical ICUs at Lahey Hospital and Medical Center (LHMC). Sedative doses will be compared to 28-day ventilator-free days to determine if greater sedative doses are correlated with longer duration of mechanical ventilation at our institution.

**Methods:** This study is a single-center retrospective chart review of sedation practices at LHMC between January 2021 and June 2021. Patients were included if they were mechanically ventilated for at least 24 hours but no longer than 7 days. Patients with sedatives ordered to titrate to a goal Sedation-Agitation Scale (SAS) score of 1-2 (deep sedation) were excluded. Baseline demographics and clinical characteristics will be collected. The primary outcome will assess the correlation between 28-day ventilator-free days and average sedative dose using regression analysis. Secondary outcomes include the percent of time the patient was at a goal level of sedation (SAS 3-4) and the percent of time below goal level of sedation (SAS ≤ 2). Additional outcomes include percent of ventilator free days within 7 days of intubation, frequency and documentation of daily Spontaneous Awakening Trials (SATs), percent of patients whose sedative dose was appropriately reduced by 50% after failing a SAT, and incidence of deep sedation in the first 48 hours of intubation.

**Results:** A total of 133 patients have been reviewed of which 55 patients met inclusion criteria. The median age was 69 years (IQR 57-79) and median BMI was 28.0 kg/m² (IQR 23.9-40.0). 32.7% of subjects were female, 9% had a history of chronic opioid use, and only 9% of patients were admitted with acute respiratory distress syndrome. 82%, 62%, 42%, and 40% of patients received propofol, fentanyl, dexmedetomidine, and midazolam respectively. The median length of mechanical ventilation was 61.5 hours (IQR, 38.5 - 98). Data collection is ongoing and primary and secondary outcomes will be presented.
Conclusions: It is anticipated that this project will provide guidance on appropriate sedation practices at LHMC and serve as a resource to determine areas for improvement.
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**Presenter Name:** Panchisin, Alison  
**Organization:** WellSpan York Hospital  
**Category:** Cardiovascular/Critical Care  
**Day | Session | Room | Time:** Monday | 1 | Empire A | 12:30:00 PM

**Authors:** Alison Panchisin, PharmD, Geoffrey Arentz, PharmD, BCPS, Joseph DiBlasi, PharmD, MBA, Jill Rusinko, PharmD  

**Title:** Evaluation of seizure prophylaxis in subarachnoid hemorrhage  

**Objectives:** WellSpan York Hospital uses levetiracetam for seizure prophylaxis in non-traumatic subarachnoid hemorrhage (SAH) patients, however there is controversial data supporting use of seizure prophylaxis in this population. The purpose of this study was to assess the use of levetiracetam at our institution and associated outcomes.

**Methods:** A retrospective chart review of 85 adult patients with non-traumatic SAH from January 1st, 2020 through December 31st, 2021 was performed. Patients were excluded if they did not have an ICU stay, had history of seizure, had a positive ethanol and/or illicit substance screen on admission, or admitted as a trauma. The primary outcome was percentage of patients with SAH on seizure prophylaxis. Secondary outcomes included percentage of patients who developed seizure while on seizure prophylaxis, average duration of seizure prophylaxis compared to Hunt Hess and Fisher scores, and average total cost of levetiracetam per patient during hospitalization.

**Results:** A total of 61 patients were included in the study. Levetiracetam was initiated in 50 (82%) patients. Of the patients on levetiracetam, 46 (92%) had prophylaxis as the indication. Out of the 4 (8%) patients who developed seizures, 2 patients were already on prophylaxis prior to the witnessed seizure. Average inpatient levetiracetam duration was 12 days. If levetiracetam was continued outpatient, the average duration was 49 days. Duration of levetiracetam prophylaxis on average was longer with Hunt Hess and Fisher scores of 3 or higher. Levetiracetam was dosed appropriately for renal function in 48 (96%) patients. Agitation occurred in 22 (36%) patients. The estimated total inpatient cost of levetiracetam use was $37,116. There was an average inpatient cost per patient of $742.

**Conclusions:** Majority of patients with SAH are initiated on levetiracetam for seizure prophylaxis. The vast majority of patients on levetiracetam were dosed appropriately based on renal function. There was a small number of patients who developed agitation during their admission. Levetiracetam duration and therefore cost varied greatly among patients.
Authors: A. Patel, M. Pajoumand, M. Armahizer; University of Maryland Medical Center, Baltimore, MD

Title: Evaluation of venous thromboembolism prophylaxis in patients with ventriculostomy

Objectives: A ventriculostomy with external ventricular drain placement (EVD) is a common neurocritical care procedure. Patients with an EVD are at an increased risk of venous thromboembolic events (VTE). Due to this risk, pharmacologic prophylaxis with low-molecular-weight heparin (LMWH) or unfractionated heparin (UFH) is indicated in patients without contraindications. At our institution, UFH was preferred for VTE prophylaxis in these patients; however, following a nationwide UFH shortage, our institution began to use LMWH. Thus, our objective of this study was to evaluate the safety and efficacy of LMWH versus UFH for the prevention of VTE in patients with an EVD.

Methods: We performed a retrospective cohort study of 92 patients presenting with intracranial hemorrhage or traumatic brain injury between March 2019 and May 2020, with a washout period in September and October of 2019. Patients were included in this study if they had an EVD, received LMWH or UFH for VTE prophylaxis following EVD placement, and underwent serial computed tomography (CT) imaging during hospitalization. Patients were excluded if they received fondaparinux or therapeutic anticoagulation for an active VTE. Our primary safety endpoint was the incidence of new or expanding hemorrhage and hematoma during the duration of VTE prophylaxis with LMWH as compared to UFH. Our secondary efficacy endpoint was the incidence of documented VTE during the hospitalization with LMWH as compared to UFH.

Results: Baseline characteristics, differences in incidence of documented VTE, differences in new or expanding hemorrhage and hematoma, and the time to occurrence of bleeding and VTE events from the start of VTE prophylaxis between the LMWH and UFH groups will be presented.

Conclusions: The results of this study will aid clinicians in selecting a safe and effective pharmacologic agent for appropriate VTE prophylaxis in patients with ventriculostomy.
Implementing a multifaceted quality improvement initiative on adherence to guideline-directed medical therapy for hospitalized patients with heart failure

**Objectives:** Despite robust clinical evidence and longstanding availability, guideline-directed medical therapy (GDMT) for heart failure (HF) patients with reduced ejection fraction (HFrEF) remains persistently underutilized across the United States. In addition to 1) angiotensin converting enzyme inhibitors/angiotensin receptor blockers/angiotensin receptor-neprilysin inhibitors, 2) beta-blockers, and 3) mineralocorticoid receptor antagonists, sodium-glucose cotransporter-2 (SGLT-2) inhibitors have been recently recommended as the fourth pillar of GDMT. But this newer medication class now faces a significant implementation barrier to overcome gaps in prescribing rates. The objective of this study is to evaluate the impact of a multifaceted quality improvement initiative on the use of GDMT for hospitalized patients with HFrEF.

**Methods:** A pre-post implementation design will be used compare cohorts of patients before and after Waterbury Health, a community teaching hospital, added empagliflozin to the hospital formulary. Concurrent quality improvement initiatives include joining the American Heart Association (AHA) Get With The Guidelines® (GTWG) - Heart Failure program and planned optimization of an inpatient HFrEF order set to include empagliflozin. One hundred patients from the pre-implementation cohort will be randomly selected as a representative historical control sample. One hundred consecutive patients from the post-implementation cohort will be included as a contemporary comparator. Patients with a left ventricular ejection fraction (LVEF) greater than 40% will be excluded. Demographic characteristics including comorbidities, LVEF, vital signs, serum creatinine, estimated glomerular filtration rate, potassium, N-terminal or B-type natriuretic peptide levels, and baseline prescribing rates of GDMT will be collected. The primary outcome will be the change in proportion of patients prescribed all four classes of disease-modifying therapy for HFrEF upon hospital discharge.

**Results:** It is anticipated that the pre-implementation HFrEF cohort will have a suboptimal proportion of patients prescribed all four classes of GDMT compared to the post-implementation patients, particularly with respect to SGLT-2 inhibitors.

**Conclusions:** A multifaceted quality improvement initiative to increase GDMT prescribing rates for HFrEF by adding SGLT-2 inhibitors to the inpatient formulary and optimizing inpatient order
sets can improve adherence to clinical guidelines and may correspond to lower rates of rehospitalization for HF.
Prifti, Xhesiana

Evaluation of empagliflozin use in hospitalized patients with heart failure with reduced ejection fraction

Conference Abstracts
May 16-18, 2022

Presenter Name: Prifti, Xhesiana
Organization: Lahey Hospital & Medical Center
Category: Cardiovascular/Critical Care
Day | Session | Room | Time: Tuesday | 3 | Empire A | 1:45:00 PM

Authors: X. Prifti, H. Gibson, H. MacMaster, M. Zuziela, J. Lancaster

Title: Evaluation of empagliflozin use in hospitalized patients with heart failure with reduced ejection fraction

Objectives: Sodium-glucose cotransporter 2 (SGLT2) inhibitors have been shown to reduce the risk of hospitalization in patients with heart failure (HF). The American College of Cardiology supports use of SGLT2 inhibitors with guideline-directed therapy in patients with HF regardless of ejection fraction (EF). Beyond the long-term benefits of SGLT2 inhibitors, their safety and efficacy profile in hospitalized patients with HF with reduced ejection fraction (HFrEF) is lacking in the literature. Thus, the primary objective of this IRB-approved study was to evaluate the safety profile of SGLT2 inhibitor therapy in hospitalized patients with HFrEF.

Methods: Data from a single-center, academic medical center from April 2021 to November 2021 was reviewed retrospectively and analyzed using descriptive statistics. Patients were included if they had a diagnosis of HFrEF and were 1) newly initiated on an SGLT2 inhibitor during hospitalization (initiation cohort) or 2) continued on SGLT2 inhibitor therapy during admission (continuation cohort). Patients ordered for an SGLT2 inhibitor for other indications were excluded. Safety outcomes included documentation of urogenital infection, euglycemic diabetic ketoacidosis (DKA), hypoglycemic events, and development of acute kidney injury (AKI) during the admission. Secondary efficacy endpoints included 30-day and 60-day HF readmission rate, SGLT2 inhibitor discontinuation rate, and need for diuretics.

Results: A total of 115 patients were identified, 78 of whom met inclusion criteria. Forty-eight patients were identified as part of the initiation cohort and 30 patients as part of the continuation cohort. At baseline, both cohorts were comprised primarily of white (89.7%), male (80.8%) patients with a median age of 65 (Â± 11.2) years and 62.5% had a left ventricular EF range within 20-40%. No patient developed euglycemic DKA or urogenital infection during the study period. Hypoglycemic events and rates of AKI will be analyzed. Secondary endpoint analysis showed 30-day (6.4%) and 60-day (2.6%) HF-related readmission rates, 19.2% of patients had their SGLT2 inhibitor stopped during admission, and 78% of patients required diuretics during the hospitalization.

Conclusions: Outcomes suggest that SGLT2 inhibitor use during hospitalization may be safe. Confounding variables for risk of safety outcomes will be assessed in the subgroup of patients. Efficacy endpoints noted a 30 and 60-day readmission rate of <5% averaging both cohorts. The
outcomes of this retrospective study help clarify the risks and benefits of ordering an SGLT2 inhibitor during hospitalization. Additional prospective studies are warranted to evaluate its use in more diverse, larger populations.
Title: Evaluation of the safety of SGLT2 inhibitors in patients admitted for HFrEF

Objectives: The addition of sodium-glucose cotransporter inhibitors (SGLT2i) to guideline-directed medication therapy demonstrated a decreased risk of worsening heart failure or death. However, limited safety information is available when SGLT2i are added during hospital admission for patients with heart failure with reduced ejection fraction. The study’s objective was to determine the safety of initiating an SGLT2i regimen compared to those started on mineralocorticoid receptor antagonist (MRA) among patients admitted for cardiovascular-related problems.

Methods: This study was a retrospective, single center chart review at a large academic medical center. Patients were included if they were admitted to the hospital for a cardiovascular problem; acute decompensated heart failure, atrial fibrillation, NSTEMI, and STEMI, were age 18 years or older, had NYHA class I to IV symptoms with an ejection fraction of <40 ± 5 and were already prescribed guideline directed medical therapy (GDMT), defined as at least a beta-blocker and afterload reducing agent. Patients were excluded if they had type 1 diabetes or an eGFR < 20 mL/min. The primary outcome includes the incidence of AKI (increase of serum creatinine of ≥1.3x from last level at discharge), potassium abnormality, occurrence of urinary tract infection and/or Fournier gangrene, discontinuation of SGLT2 and MRA, and overall incidence of adverse events within 90 days of index hospitalization. Secondary outcomes included any hospitalizations within 90 days of discharge.

Results: Of the 264 patients screened, 74 were included with 36 patients discharged on a MRA, 23 on a SGLT2i, and 15 patients on both. The mean age was similar between patients in the three groups (62.2 years ± 17.6 vs 59.7 ± 12.3 years vs 59.7 ± 12.0 years, respectively). The male gender was evenly distributed between the groups (72%, 74%, and 73% respectively). The mean EF were 26%, 26%, and 21% respectively. The primary diagnosis of acute decompensated heart failure made up 69%, 69%, and 80% of the admissions. The study found that incidence of hyperkalemia was higher in the SGLT2i group compared to the MRA and MRA/SGLT2i group (5/23 (21.7%) vs 0/36 (0%) vs 0/15 (0%), respectively, p-value=0.003). All other outcomes were found to be similar between the groups.

Conclusions: This study found that besides incidences of hyperkalemia there were no significant difference found in the rate of adverse events or hospital readmission between the
three groups. This data is limited by the sample size, retrospective designs, non-standardized medication regimens, and confounding medications that can instigate the adverse events that were observed. Based on this study, the initiation of a MRA, SGLT2i, or both at discharge showed to have a similar safety profile between the groups.
Authors: Hannah Ritchie, Taylor Hodle, Hannah Spinner

Title: Evaluation of antipsychotic initiation in mechanically ventilated medical intensive care unit patients

Objectives: Mechanically ventilated patients in the ICU often require pain and sedative medications. The Society of Critical Care Medicine's Guidelines for the Prevention and Management of Pain, Agitation/Sedation, Delirium, Immobility, and Sleep Disruption (PADIS) promote use of analgosedation to minimize pain, reduce anxiety, and facilitate care. The PADIS guideline also suggests against routine use of antipsychotics to prevent or treat delirium. Baystate Medical Center's (BMC) adaptation of the PADIS guideline incorporates assessment-driven, protocol-based pain and sedation management. For delirium, the BMC guideline suggests a short course of antipsychotics in patients with agitated delirium, defined as CAM-ICU (+) with RASS > +2. While discussion of antipsychotic use in the ICU is mostly related to delirium, a recent study assessed whether quetiapine reduced sedative requirements among mechanically ventilated adults without delirium. The purpose of this project is to assess adherence to our institutional guideline for antipsychotic use in critically ill patients and to describe sedative use in relation to antipsychotic initiation.

Methods: This retrospective review includes patients admitted to the medical ICU at BMC who had quetiapine, olanzapine, or haloperidol ordered between June 2020 â€“ June 2021. Patients are included if they were mechanically ventilated at time of antipsychotic initiation, received > 3 doses of antipsychotics, and did not meet any exclusion criteria. Exclusion criteria are psychiatric disorder with outpatient antipsychotic therapy, use of antipsychotics in other inpatient unit prior to ICU transfer, continuous neuromuscular blockade in the 24 hours before or after antipsychotic initiation, intentional extubation < 24 hours after initiation, and active SARS-CoV-2 infection. The primary outcome of interest is adherence to BMC's guideline for use of antipsychotics in critically ill patients with agitated delirium. Secondary outcomes of interest are CAM-ICU and RASS at time of antipsychotic initiation, change in sedative and analgesic infusion rates following initiation, total daily dose of opioids, and change in ventilator setting, defined as transition from assist control to pressure support ventilation (PSV) with patient sustained on PSV for > 12 hours.
**Results:** Analysis of the endpoints will be evaluated to summarize appropriate antipsychotic initiation per institution protocol and to describe sedative use in relation to antipsychotic initiation.

**Conclusions:** Characterization of the use of antipsychotics in this patient population will help our pharmacists and providers better understand prescribing practices as compared to guideline recommendations. Assessment of antipsychotic effects on sedative requirements will also further guide our ICU practice and assist practitioners in using antipsychotics appropriately.
Comparing Outcomes in Intubated ICU Patients During Protocolized Management of Analgesia/sedation vs Shift to Analgosedation

Objectives: Intubated patients in the intensive care unit (ICU), typically require medications to maintain adequate comfort. Pain and sedation in the ICU are managed with both analgesic medications and sedative medications, however these medications may be utilized differently. The shift to analgosedation practices occurred at our institution in Fall of 2017. Analgosedation is the practice of achieving analgesia first, then sedation and/or using analgesic medications to achieve sedative properties. This is done to prevent oversedation and undertreating pain and reducing ventilator and ICU days. The objective of this study is to assess the impact on time to extubation caused by the shift to analgosedation based management of intubated ICU patients.

Methods: This IRB approved, retrospective comparative study assesses the management of intubated ICU patients utilizing protocolized analgesia and sedation vs analgosedation during two time periods. Inclusion: 21 years of age or older, admitted to the adult ICU, intubated for at least 48 hours, and received continuous pain/sedative medications. Additional criteria for the analgosedation group includes fentanyl infusion rates of at least 200 mcg/hour or targeting a therapeutic goal of RASS. Exclusion: status epilepticus requiring high dose benzodiazepine infusions, history of substance abuse, acute respiratory distress syndrome, and patients who had tracheostomies performed during index ICU stay. The primary outcome will be time to extubation (days). Secondary outcomes will include ICU mortality, ICU length of stay (LOS), and supplemental sedative doses. Safety outcomes will include: hemodynamics (blood pressure, heart rate), incidence of: unplanned extubations, opioid dependence after transfer out of and/or at hospital discharge, delirium, and ileus. Categorical data will be assessed using chi-squared or Fischer's-exact test and continuous data will be assessed using student t-tests.

Results: In progress

Conclusions: In progress
Santiago, Christian

Low dose apixaban versus standard dose apixaban in patients with atrial fibrillation and end-stage renal disease in a veteran population

Conference Abstracts
May 16-18, 2022

Presenter Name: Santiago, Christian
Organization: Veterans Affairs Boston Healthcare System
Category: Cardiovascular/Critical Care
Day | Session | Room | Time: Wednesday | 5 | Empire A | 1:15:00 PM

Authors: Santiago, Christian, PharmD; Quilter, Meghan, PharmD; Wood, Bryan, PharmD; Veterans Affairs Boston Healthcare System (VABHS), Boston, Massachusetts

Title: Low dose apixaban versus standard dose apixaban in patients with atrial fibrillation and end-stage renal disease in a veteran population

Objectives: In 2012, the FDA approved standard dose apixaban in patients with atrial fibrillation (AF) and end-stage renal disease (ESRD) on dialysis. However, this approval was based on limited, single-dose, pharmacokinetic studies. Since its approval for dialysis patients, there have been further meta-analyses and retrospective trials comparing the safety and efficacy of apixaban to warfarin and placebo with controversial results. The objective of this study is to provide further insight in evaluating the safety of low dose vs standard dose apixaban in patients with AF and ESRD to help guide clinical decision making at our institution.

Methods: A retrospective chart review using the electronic health record at VABHS was conducted to identify patients with AF requiring anticoagulation and ESRD. Patients were eligible for inclusion if they were over the age of 18 and had a diagnosis of AF and ESRD (eGFR < 15 ml/min/1.73 m^2) with or without dialysis. Patients were excluded if they had advanced liver disease, a mechanical heart valve, or moderate to severe mitral stenosis. Patient charts were reviewed for incidences of bleeding requiring hospitalization, all-cause hospitalization, all-cause death, and new stroke or systemic embolism since treatment initiation. Patients were followed until the end of the study period (one year), occurrence of study outcome, change in dose or anticoagulation prescription, or a refill gap of greater than 30 days without documentation justifying lapse in refills.

Results: The number and percentage of patients experiencing bleeding requiring hospitalization, all-cause hospitalization, all-cause death, and new stroke or systemic embolism since treatment initiation will be recorded and results will be presented.

Conclusions: It is anticipated that this project will improve quality of care and informed decision making in selecting appropriate regimens for patients with ESRD and AF who require anticoagulation with apixaban.
Presenter Name: Santos, Alyssa  
Organization: Saint Francis Hospital and Medical Center  
Category: Cardiovascular/Critical Care  
Day | Session | Room | Time: Monday | 1 | Crystal B | 12:45:00 PM

Authors: A. Santos, M. Carroll, J. Dodge, A. Winston, J. Yee; Saint Francis Hospital and Medical Center (SFHMC), Hartford, Connecticut

Title: Evaluation of midodrine use on clinical outcomes in septic shock

Objectives: To evaluate the efficacy and safety of oral midodrine in weaning intravenous (IV) vasopressors in critically ill patients with septic shock.

Methods: This was a retrospective chart review in 118 patients who were admitted to the medical and cardiac intensive care units (ICU) who received at least one IV vasopressor. Included patients with a diagnosis of septic shock were divided into two groups and case-matched: those who received only vasopressors (the control group) and those who received vasopressors with adjunctive midodrine (midodrine group).

Results: The following outcomes, in days, were significantly increased in the midodrine group vs the control group: median ICU LOS [9 vs 4.1, (P < 0.01)], median hospital LOS [13.9 vs 8.3 (P < 0.01)], and median duration of vasopressor use [5.3 vs 2.3 (P < 0.01)]. There was no difference in hospital mortality between the two groups (P = 0.57). Bradycardia was noted in 6 patients treated with midodrine. No patients treated with midodrine experienced hypertension.

Conclusions: The use of midodrine was associated with increased ICU and hospital LOS and duration of vasopressor use; however, the results may indicate that midodrine was being used as salvage therapy instead of during recovery from septic shock. Midodrine was not associated with clinical benefits in this setting.
Title: Appropriateness of apixaban dosing before and after implementation of order set in an inpatient setting at community teaching hospital

Objectives: In the past decade, the use of direct oral anticoagulants (DOACs) have become increasingly popular at the expense of warfarin. Apixaban, a direct factor Xa inhibitor, is commonly prescribed for multiple indications ranging from the prevention of stroke in nonvalvular atrial fibrillation to treatment of venous thromboembolism and pulmonary embolism. For each indication, apixaban has a unique dosing pattern which ultimately causes potential for prescribing errors. The implementation of an order set for apixaban at a community hospital will serve to improve prescribing practices and augment patient safety.

Methods: Electronic medical records were reviewed for inpatient orders of apixaban two months before implementation of the apixaban order set. Data collected from these records subsequently determined patient eligibility in the study. Inpatient apixaban orders for all indications were collected. Apixaban orders were evaluated and patient characteristics, such as age, sex, race and indication for apixaban were collected and evaluated in comparison to the most up to date apixaban package insert data. Pertinent laboratory parameters such as serum creatinine, body-mass index, hepatic function tests and other pertinent criteria were collected during the same time frame. The most recent lab values prior to initiation were used to determine appropriateness.

Results: The percent of apixaban orders dosed inappropriately before implementation of the apixaban order set will be recorded and results will be presented.

Conclusions: It is anticipated that this project will demonstrate the need for quality improvement initiatives for inpatient prescribing of apixaban in order to increase prescriber adherence to package insert dosing and ensure patient safety.
**Conference Abstracts**  
May 16-18, 2022

**Presenter Name:** Seidel, Rachel  
**Organization:** Geisinger Medical Center  
**Category:** Cardiovascular/Critical Care  
**Day | Session | Room | Time:** Monday | 2 | Empire A | 4:30:00 PM

**Authors:** Rachel Seidel, Pharm.D., Laura Brickett, Pharm.D., BCCCP, Dr. James Gregory, MD, FACS

**Title:** Morbidity of early chemical deep vein thrombosis prophylaxis after traumatic intracranial hemorrhage

**Objectives:** Patients presenting with traumatic intracranial hemorrhage (tICH) are at increased risk of developing a deep vein thrombosis (DVT) and subsequent pulmonary embolism (PE). Recommendations regarding timing of chemical DVT prophylaxis vary from center to center based on concern for risk of hemorrhage expansion. This study assessed intracranial morbidity based on time of chemical DVT prophylaxis under guidelines that initiate this therapy on hospital day 2.

**Methods:** A retrospective cohort study of adult patients admitted to the trauma service for tICH analyzed hemorrhage expansion requiring surgical or medical intervention from January 1st, 2014 to August 31st, 2021. Patients were excluded if they met any of the following criteria: coagulopathy at the time of admission, brain death or hospital discharge within 48 hours from admission, urgent neurosurgical intervention on hospital day 1, transferred to our institution greater than 24 hours after injury, other contraindications to early chemical DVT prophylaxis, or pregnancy. Three groups of patients were studied based on time of initiation of chemical DVT prophylaxis: < 24 hours, 24 hours to < 72 hours, and ≥ 72 hours.

**Results:** Morbidity associated with intracranial hemorrhage will be reported as percentages and compared among the three groups. Deviation from the institutional protocol and in-hospital VTE will be reported as secondary outcomes. Finalized results will be presented at the 2022 Eastern States Residency Conference.

**Conclusions:** It is anticipated that this retrospective cohort will demonstrate no difference in intracranial hemorrhage morbidity based on timing of chemical DVT prophylaxis.
Pharmacist-driven ceftriaxone dosing protocol in critically ill patients

Objectives: The objective of this study is to evaluate the effect of a pharmacist-driven protocol, which utilizes serum albumin in dosing ceftriaxone, on reduction of treatment failure in critically ill patients.

Methods: In the retrospective phase of this study, patients admitted to the intensive care unit (ICU) between January 1st 2021 and September 30th 2021, who received ceftriaxone 1 g or 2 g for the treatment of a urinary tract infection, skin and soft tissue infection, intra-abdominal infection, or pneumonia were examined. In the prospective phase of this study, patients admitted to the ICU between October 1st 2021 and March 31st 2022, received ceftriaxone based on a pharmacist-driven dosing protocol. The protocol dosed patients with serum albumin levels less than 2.5 g/dL on ceftriaxone 2 g intravenously daily, or patients with serum albumin levels greater than or equal to 2.5 g/dL on ceftriaxone 1 g intravenously daily. Appropriate statistical tests were used to analyze the primary endpoint of treatment failure, a composite of inpatient mortality and antibiotic escalation, and secondary endpoints of ICU length of stay, hospital length of stay, and total ventilator days.

Results: In the retrospective phase, a total of 76 patients met inclusion and exclusion criteria: 43.4% of patients were treated for pneumonia, and 43.4% for a urinary tract infection. Treatment failure occurred in 11.8% of patients. In-hospital mortality occurred in 5.3% of patients, while antibiotics were escalated in 10.5% of patients. The median (interquartile range) ICU length of stay was 2 days (2â”4), median hospital length of stay was 8.5 days (6â”12.5), and median ventilator days was 1 day (0â”2). Prospective primary and secondary endpoints will be compared to the retrospective data and presented.

Conclusions: It is anticipated that the results will suggest critically ill patients with hypoalbuminemia may require ceftriaxone 2 g intravenous daily for certain infections, while patients without hypoalbuminemia may suffice with ceftriaxone 1 g intravenous daily. The results of this study can lead to the creation and implementation of a pharmacist initiated, automatic dose-adjustment policy to dose ceftriaxone based on baseline serum albumin levels.
Shah, Krishna

Identifying local risk factors for Pseudomonas aeruginosa and methicillin resistant Staphylococcus aureus in patients presenting with community acquired pneumonia: a retrospective, single center chart review

Conference Abstracts
May 16-18, 2022

Presenter Name: Shah, Krishna
Organization: Penn Medicine Princeton Health
Category: Cardiovascular/Critical Care
Day | Session | Room | Time: Tuesday | 3 | Magnolia B | 12:30:00 PM

Authors: Krishna Shah, PharmD, MS; Hinal Patel, PharmD, BCPS

Title: Identifying local risk factors for Pseudomonas aeruginosa and methicillin resistant Staphylococcus aureus in patients presenting with community acquired pneumonia: a retrospective, single center chart review

Objectives: Healthcare-associated pneumonia (HCAP) was initially categorized as a separate entity in treatment guidelines as it was thought that these patients were at higher risk for multidrug resistant organisms. New evidence prompted Infectious Diseases Society of America (IDSA) guideline changes resulting in the removal of HCAP treatment category and advising clinicians to only empirically cover for Pseudomonas aeruginosa and methicillin-resistant Staphylococcus aureus (MRSA) if local risk factors are present. The primary objective of this study is to determine what risk factors are associated with MRSA and Pseudomonas aeruginosa community acquired pneumonia (CAP) at Princeton Medical Center.

Methods: This is a retrospective, single center chart review of patients diagnosed with pneumonia between July 1, 2018 and June 30, 2021. Inclusion criteria include males and females admitted to inpatient status, classified as having CAP, and who had a collection of respiratory culture on admission. Patient records were reviewed to determine the presence of risk factors. Exclusion criteria include lack of chest x-ray, pulmonary computed tomography, or respiratory collection on admission, diagnosis of hospital or ventilator-acquired pneumonia, pneumonia due to SARS-CoV-2, bronchiectasis exacerbation, ventilator associated tracheobronchitis, immunocompromised patients, and patient does not meet predetermined ICD-10 code as primary diagnosis for encounter. Statistical significance to predict risk factor association will be determined by multiple logistic regression.

Results: The risk factors predictive of MRSA and Pseudomonas aeruginosa for CAP at Princeton Medical Center will be presented.

Conclusions: It is anticipated that this project will validate risk factors present for clinicians to determine empiric coverage necessary for MRSA and Pseudomonas aeruginosa CAP.
Authors: R Shamis; T Kang; E Dryden; N Kalaria; L Zizza. ChristianaCare Health System; Newark, DE

Title: Glycemic control among different insulin regimens in critically ill adults receiving continuous enteral feeds

Objectives: The ASPEN guidelines recommend a glucose goal of 140-180 mg/dL in critically ill patients. However, these guidelines do not provide specific recommendations on how to achieve this goal. The objective of this study was to compare the incidence of hyper/hypo/euglycemia among different insulin regimens in patients receiving continuous enteral tube feeds (TF) across the cardiac, neuro, medical, and surgical intensive care units (ICU) at ChristianaCare Hospital.

Methods: This retrospective study, conducted at an academic medical center between 2018 and 2019, included patients age >18 years that received intermittent insulin while on continuous enteral TF. Patient exclusions were receipt of an insulin drip while on TF, parenteral nutrition, or U-500 insulin, or a diagnosis of diabetic ketoacidosis/hyperosmolar hyperglycemic syndrome or COVID-19. The four most used insulin regimens were selected for analysis. The primary outcome was the composite number of dysglycemic (hypo- and hyperglycemic) episodes daily for the first five days of TF per insulin regimen. Secondary outcomes included the time in range (TIR) of blood glucose for each regimen, and the individual number of hypo- and hyperglycemic episodes. The Kruskal-Wallis test was used to assess the primary and secondary outcomes.

Results: Of 435 patients randomly reviewed, 100 met the inclusion criteria. The mean age was 65 years + 14.4, and 54% of patients were male. During the study period, most patients received more than one insulin regimen. The composite and individual percentages of dysglycemic episodes for Aspart, Regular, Aspart+Glargine and Aspart+NPH regimens were 45%, 61%, 41% and 46% (p=0.001) and 96.6%, 98.4%, 99.4%, and 100%, respectively (p=0.001). Of dysglycemic episodes, majority were hyperglycemia. The number of hypoglycemic episodes were not statistically significantly different among the four insulin regimens (p=0.1). The TIR for Aspart, Regular, Aspart+Glargine, and Aspart+NPH regimens were 55%, 39%, 59%, and 54%, respectively (p=0.005).

Conclusions: Regular insulin resulted in the most dysglycemic episodes while Aspart+Glargine resulted in the least. The regimen with the greatest TIR was Aspart+Glargine. All regimens resulted in <3% episodes of hypoglycemia, which is most often associated with poor outcomes.
associated with morbidity/mortality. Given these results, this study suggests that Aspart+Glargine may be the most optimal regimen for achieving the ASPEN blood glucose goal of 140-180 for critically ill patients on TF.
Glycemic control among different insulin regimens in critically ill adults receiving continuous enteral feeds

Objectives: The ASPEN guidelines recommend a glucose goal of 140-180 mg/dL in critically ill patients. However, these guidelines do not provide specific recommendations on how to achieve this goal. The objective of this study was to compare the incidence of hyper/hypo/euglycemia among different insulin regimens in patients receiving continuous enteral tube feeds (TF) across the cardiac, neuro, medical, and surgical intensive care units (ICU) at ChristianaCare Hospital.

Methods: This retrospective study, conducted at an academic medical center between 2018 and 2019, included patients age >18 years that received intermittent insulin while on continuous enteral TF. Patient exclusions were receipt of an insulin drip while on TF, parenteral nutrition, or U-500 insulin, or a diagnosis of diabetic ketoacidosis/hyperosmolar hyperglycemic syndrome or COVID-19. The four most used insulin regimens were selected for analysis. The primary outcome was the composite number of dysglycemic (hypo- and hyperglycemic) episodes daily for the first five days of TF per insulin regimen. Secondary outcomes included the time in range (TIR) of blood glucose for each regimen, and the individual number of hypo- and hyperglycemic episodes. The Kruskal-Wallis test was used to assess the primary and secondary outcomes.

Results: Of 435 patients randomly reviewed, 100 met the inclusion criteria. The mean age was 65 years + 14.4, and 54% of patients were male. During the study period, most patients received more than one insulin regimen. The composite and individual percentages of dysglycemic episodes and hyperglycemic episodes for Aspart, Regular, Aspart+Glargine and Aspart+NPH regimens were 45%, 61%, 41% and 46% (p=0.001) and 96.6%, 98.4%, 99.4%, and 100%, respectively (p=0.001). The number of hypoglycemic episodes were not statistically significantly different among the four insulin regimens (p=0.1). The TIR for Aspart, Regular, Aspart+Glargine, and Aspart+NPH regimens were 55%, 39%, 59%, 54%, respectively (p=0.005).

Conclusions: Regular insulin resulted in the most dysglycemic episodes while Aspart+Glargine resulted in the least. The regimen with the greatest TIR was Aspart+Glargine. All regimens resulted in <3% episodes of hypoglycemia, which is most often associated with poor outcomes.
associated with morbidity/mortality. Given these results, this study suggests that Aspart+Glargine may be the most optimal regimen for achieving the ASPEN blood glucose goal of 140-180 for critically ill patients on TF.
Authors: R Shamis; T Kang; E Dryden; N Kalaria; L Zizza. ChristianaCare Health System; Newark, DE

Title: Glycemic control among different insulin regimens in critically ill adults receiving continuous enteral feeds

Objectives: The ASPEN guidelines recommend a glucose goal of 140-180 mg/dL in critically ill patients. However, these guidelines do not provide specific recommendations on how to achieve this goal. The objective of this study was to compare the incidence of hyper/hypo/euglycemia among different insulin regimens in patients receiving continuous enteral tube feeds (TF) across the cardiac, neuro, medical, and surgical intensive care units (ICU) at ChristianaCare Hospital.

Methods: This retrospective study, conducted at an academic medical center between 2018 and 2019, included patients age >18 years that received intermittent insulin while on continuous enteral TF. Patient exclusions were receipt of an insulin drip while on TF, parenteral nutrition, or U-500 insulin, or a diagnosis of diabetic ketoacidosis/hyperosmolar hyperglycemic syndrome or COVID-19. The four most used insulin regimens were selected for analysis. The primary outcome was the composite number of dysglycemic (hypo- and hyperglycemic) episodes daily for the first five days of TF per insulin regimen. Secondary outcomes included the time in range (TIR) of blood glucose for each regimen, and the individual number of hypo- and hyperglycemic episodes. The Kruskal-Wallis test was used to assess the primary and secondary outcomes.

Results: Of 435 patients randomly reviewed, 100 met the inclusion criteria. The mean age was 65 years ± 14.4, and 54% of patients were male. During the study period, most patients received more than one insulin regimen. The percent of dysglycemic episodes for Aspart, Regular, Aspart+Glargine and Aspart+NPH regimens were 45%, 61%, 41% and 46%, respectively (p=0.001), and of the dysglycemic episodes, the percent of hyperglycemic episodes were 96.6%, 98.4%, 99.4%, and 100%, respectively (p=0.001). The number of hypoglycemic episodes were not statistically significantly different among the four insulin regimens (p=0.1). The TIR for Aspart, Regular, Aspart+Glargine, and Aspart+NPH regimens were 55%, 39%, 59%, 54%, respectively (p=0.005).

Conclusions: Regular insulin resulted in the most dysglycemic episodes while Aspart+Glargine resulted in the least. The regimen with the greatest TIR was Aspart+Glargine. All regimens resulted in <3% episodes of hypoglycemia, which is most often associated with poor outcomes.
associated with morbidity/mortality. Given these results, this study suggests that Aspart+Glargine may be the most optimal regimen for achieving the ASPEN blood glucose goal of 140-180 for critically ill patients on TF.
Objective: Iron deficiency (ID) is a common complication among patients with heart failure (HF), with an estimated prevalence of over 50 percent in ambulatory patients. Iron deficiency is associated with reductions in quality of life, functional capacity, and life expectancy in patients with heart failure. Treatment of iron deficiency with intravenous ferric carboxymaltose has demonstrated benefit, leading to recommendations from the American College of Cardiology and American Heart Association that all patients with HF be screened for ID and considered for treatment. Due to the sizeable prevalence and pathophysiological concerns, this study sought to evaluate the historical and current proportion of patients with heart failure appropriately screened for iron deficiency.

Methods: This study was a prospective, non-randomized, pre- and post-intervention cohort study that evaluated the historical and current proportion of patients with heart failure at a medical resident-led primary care clinic that were screened and/or treated for iron deficiency. The intervention consisted of education presented to providers regarding screening and treatment of iron deficiency in HF. Patients 18 years and older with a diagnosis of heart failure were included in the pre-intervention cohort if seen by a primary care provider from September 1, 2020 to September 30, 2021. The post-intervention cohort had similar inclusion criteria with a time frame of November 1, 2021 to February 28, 2022. This study excluded patients with recent trauma or severe blood loss, recent gastrointestinal bleed, chronic inflammatory disease, pregnancy, or active malignancy.

Results: The primary outcome to be presented is the change in proportion of patients with heart failure screened for iron deficiency after pharmacist-led education at a medical resident-led primary care clinic. Secondary outcomes included proportion of patients treated for iron deficiency, complete versus incomplete screenings, and all-cause hospitalization. Data collected included patient demographics, HF classification, laboratory data, and hospitalizations. Results to be presented.
Conclusions: It is projected that this study will demonstrate a role for screening and treating patients with heart failure for iron deficiency in order to increase alliance with evidence based guidelines.
**Presenter Name:** Small, Alexis  
**Organization:** Portsmouth Regional Hospital  
**Category:** Cardiovascular/Critical Care  
**Day | Session | Room | Time:** Monday | 2 | Empire A | 3:00:00 PM

**Authors:** Alexis L. Small PharmD, Jessica K. Marx PharmD BCPS  
**Title:** Comparison of Tenecteplase vs. Alteplase in the Setting of Acute Ischemic Stroke  

**Objectives:** In the event of an acute ischemic stroke, it is important to quickly administer a thrombolytic agent within 4.5 hours of symptom onset. Alteplase currently has an FDA approved indication for acute ischemic stroke, tenecteplase does not; tenecteplase can be used off-label in this setting. The pharmacologic profile for tenecteplase is more appealing than alteplase with tenecteplase offering a longer half-life and higher fibrin affinity. Tenecteplase dosing provides a smaller margin of error for dose calculation and easier dose administration compared to alteplase. The modified Rankin scale (mRS) is a measure of global disability and is widely used to evaluate stroke patient outcomes. Its validity and reliability have been proven through multiple types of evidence. The purpose of this study is to compare tenecteplase versus alteplase in the setting of acute ischemic stroke to prove tenecteplase can be used as a first line agent.

**Methods:** At Portsmouth Regional Hospital, tenecteplase became the first line fibrinolytic to be used in the setting of acute ischemic stroke as of October 1 2021. This will be an ongoing prospective cohort study reviewing patients with a diagnosis of acute ischemic stroke who received tenecteplase as a thrombolytic agent. Patients who had received alteplase as a thrombolytic agent for acute ischemic stroke will also be reviewed retrospectively from September 28 2020 to September 28 2021 to use as a comparison for tenecteplase data. Inclusion criteria are as follows: patients who received tenecteplase or alteplase for a suspected acute ischemic stroke within 4.5 hours of symptom onset or within 4.5 hours of awakening with symptoms. Exclusion criteria will include standard contraindications to thrombolytic therapy and no recorded Modified Rankin Scale (mRS). The primary endpoint will measure time to recovery using a mRS (0-3 being a favorable outcome). Secondary endpoints will include the average difference between premorbid mRS and post thrombolytic administration mRS, and door to needle time of administration. Safety endpoints will include death and bleeding of any severity.

**Results:** From September 28 2020 to September 29 2021 there were 64 patients that received alteplase for the indication of acute ischemic stroke. From October 1 2021 to present, there were 17 patients that received tenecteplase for the indication of acute ischemic stroke. Five patients were excluded from the alteplase group due to no recorded mRS, while 4 patients were
excluded from the tenecteplase group for the same reason. The average mRS for the alteplase group was 3.7 with an average difference in premorbid mRS and post thrombolytic administration mRS of 2.9. The average mRS for the tenecteplase group was 2.8 with an average difference in premorbid mRS and post thrombolytic administration mRS of 1.8. The average door to needle time for the alteplase group was 41.29 minutes and for the tenecteplase group was 31.93 minutes. There were two bleeding events in the alteplase group that took place post-administration with one being categorized as major and the other minor. There was 1 moderate bleeding event in the tenecteplase group that took place post-administration. Results will continue to be reported on ongoing tenecteplase administration.

**Conclusions:** It is anticipated that the results of this study will show non-inferiority of tenecteplase compared to alteplase in the setting of acute ischemic stroke.
**Presenter Name:** Tang, Christina  
**Organization:** Northwell Health- Peconic Bay Medical Center  
**Category:** Cardiovascular/Critical Care  
**Day | Session | Room | Time:** Tuesday | 4 | Crystal B | 3:30:00 PM  

**Authors:** C. Tang, PharmD; B. Van Slyke, PharmD; Peconic Bay Medical Center, Riverhead, New York  

**Title:** Evaluation of a pharmacist-led review of heart failure medications in increasing guideline directed medical therapy at a community hospital  

**Objectives:** Heart failure (HF) continues to be a leading cause of mortality and rehospitalization. It is projected that the total cost of HF will be ~$70 billion by 2030 and according to the Get With The Guidelines-Heart Failure Registry, ~47% of individuals admitted with HF should have had initiation of ≥1 new medication on discharge. The objective of this study is to evaluate whether a pharmacist-led review of evidence-based guideline directed medical therapy (GDMT) of HF medications while inpatient can help increase % of patients on optimized GDMT as tolerated.  

**Methods:** This study was submitted for Institutional Review Board approval and considered IRB exempt as a quality improvement study. A three-month retrospective chart review was conducted from August 2021 to November 2021 for patients > 18 years old diagnosed with HF exacerbation as a primary or secondary problem. These patients were generated through an automated report and this cohort will serve as a pharmacy review-free historic control. Patients were excluded for comfort care or hospice, ESRD requiring dialysis or renal replacement therapy, or severe COVID requiring ICU-level of care. A three-month prospective period was conducted between January 2022 to March 2022 where HF patients were targeted for implementation of titrating GDMT to target doses or initiating additional GDMT as needed per the 2021 American College of Cardiology and European Society of Cardiology HF Guidelines. Initiation of dapagliflozin was evaluated using the Northwell inpatient SGLT-2 inhibitor policy.  

**Results:** The number and percentage of patients that were optimized on GDMT will be recorded and results will be presented. Secondary outcomes include 30 day readmissions, number of medications initiated, and the number and percentage of treatments that deviated from GDMT for HF.  

**Conclusions:** It is anticipated that this project will demonstrate a role for pharmacist-based patient assessment and intervention in order to increase inpatient compliance with adherence to evidence based guidelines in the treatment of heart failure.
Presenter Name: Tran, Carolin  
Organization: Bon Secours Memorial Regional Medical Center  
Category: Cardiovascular/Critical Care  
Day | Session | Room | Time: Monday | 1 | Magnolia B | 12:45:00 PM

Authors: C. Tran, G. Stevens; Bon Secours Memorial Regional Medical Center, Mechanicsville, Virginia

Title: PLATEAU study: procalcitonin levels in patients with renal dysfunction

Objectives: Procalcitonin (PCT) levels have been studied as a biomarker to assist clinicians in the management of antimicrobial therapy for bacterial sepsis and lower respiratory tract infections (LRTI). Although literature has shown the benefit of PCT levels in assessing the presence of bacterial infection in most populations, there is a lack of published evidence in patients with renal dysfunction. Therefore, this study's objective was to assess PCT trends and their clinical significance in patients with renal dysfunction while on antimicrobial therapy for sepsis or LRTI.

Methods: A retrospective chart review was conducted on patients who were admitted to Bon Secours Memorial Regional Medical Center, a 225-bed community hospital, from September 7, 2021 â€“ December 31, 2021. Participant inclusion criteria were: age of 18 years or older, confirmed or suspected sepsis or LRTI, documented PCT order panel, and documented antimicrobial therapy. Participants were excluded if they had any of the following conditions: pregnancy, decompensated liver cirrhosis (Child-Pugh Score > 7), cancer or cancer-related conditions, burns greater than 30% of body surface area, infection for which long-term antibiotic treatment is strongly recommended (i.e. endocarditis, osteomyelitis, meningitis, orthopedic, or skin and soft tissue infections), less than two documented PCT levels, and surgery or trauma within the previous 72 hours. The primary endpoint measured the average percent decrease in PCT levels throughout antimicrobial therapy. Statistical analysis, including descriptive statistics, Mann-Whitney test, Kruskal-Wallis test, Fischer's exact test, and Chi-square test, were performed to evaluate the study's endpoints.

Results: The PCT trends will be recorded, and results will be presented.

Conclusions: It is anticipated that this project will provide additional evidence on whether PCT trends are statistically similar in patients with or without renal dysfunction. These findings may provide clinicians with the guidance needed to make antimicrobial therapy decisions to optimize patient outcomes and enhance antimicrobial stewardship.
Clevidipine versus Nicardipine as Initial Intravenous Antihypertensive Agent for Hypertensive Emergencies

Objectives: The importance of managing elevated blood pressure (BP) during emergencies such as acute ischemic stroke (AIS), intracerebral hemorrhage (ICH) and hypertensive emergency is well recognized. In these emergencies, intravenous (IV) antihypertensive therapies are usually required; however, published guidelines do not distinguish between the choice of initial IV antihypertensive agents. The objective of this study is to determine if clevidipine (CLV) compared to nicardipine (NIC) yields a faster mean time in to target BP and a more favorable safety profile.

Methods: This was a retrospective quality improvement study; patients were identified through a report of CLV or NIC orders placed between January 2019 and June 2021. Patients 18 years or older, administered either IV CLV or NIC infusion for AIS, ICH, or hypertensive emergency were included. Patients coming from the Department of Corrections (DOC), discharged from the emergency department, or diagnosed with hypertensive emergency with compelling conditions (severe pre-eclampsia, eclampsia or aortic dissection) were excluded. The primary outcome was the mean time to target BP control; secondary outcomes included occurrences of hypotension, bradycardia, and tachycardia.

Results: A total of 560 electronic entries were identified. Of those identified, 69 patients were included in the final analysis. The majority of patients who did not meet criteria were treated with NIC or CLV for post-operative BP management or were DOC patients. Mean time to target BP was 56.3 minutes in the CLV group and 195.4 minutes in the NIC group (p=0.007). Secondary outcomes such as hypotension, bradycardia, and tachycardia were not statistically different between the two agents. The CLV group was observed to require more rescue IV labetalol than the NIC group (50% vs. 19%, respective; p=0.025)

Conclusions: Although this study was limited by being retrospective and underpowered, it was interesting to observe CLV achieving a significantly shorter mean time to target BP with no significant safety differences. Additionally, the CLV group required more than twice the amount of rescue IV labetalol than the NIC group. A future analysis with a larger sample size may be beneficial to establish the clinical benefit of using CLV or NIC as an initial IV antihypertensive.
Assessing the management of patients with suspected heparin-induced thrombocytopenia at a community hospital

Objectives: Heparin-induced thrombocytopenia (HIT) is a prothrombotic and potentially life-threatening adverse drug reaction. In 2018, the American Society of Hematology (ASH) published clinical practice guidelines regarding the diagnosis and management of patients with HIT. The objective of this research was to assess provider adherence to the recommendations provided in the aforementioned guidelines and establish a pre-intervention cohort for subsequent research.

Methods: Patients were included if they were (1) admitted to EMMC between May 2019 and May 2021, (2) at least 18 years of age, and (3) were suspected to have HIT during admission, as evidenced by an order for a platelet factor 4 (PF4) assay or one of the institution’s order sets designed to manage patients with suspected HIT. Patients were excluded if they underwent cardiac surgery during admission, were pregnant and/or lactating, had repeat PF4 testing within the study period, or did not receive heparin within the past 100 days. After enrollment, patients were allocated into one of two groups; those who were managed in accordance with ASH recommendations for laboratory testing (group A) versus those who were not (group B).

Results: Of the 90 patients included for analysis, 63 patients (70%) received HIT management in accordance with the guidelines (group A), 25 patients (27.8%) were managed with an alternative strategy (group B), and 2 patients did not have 4Ts scores documented. In group A, alternative anticoagulation was indicated in 62 of the 63 patients and was initiated in 26 patients accordingly (41.9%). In group B, alternative anticoagulation was indicated in 1 of the 25 patients but was not initiated. A total of 7 patients in group B received alternative anticoagulation. The duration of alternative anticoagulation in group A ranged from 1 to 652 hours, with an average duration of 95 hours, versus 14 to 565 hours in group B, with an average duration of 191 hours (p = 0.18). The average length of stay in group A versus group B was 17.4 days versus 16.2 days, respectively (p = 0.48).

Conclusions: Most patients in our study were managed in accordance with the 2018 ASH clinical practice guidelines. Our findings suggest an opportunity to further improve the management of patients with suspected HIT, as over 25% of patients were managed outside of
current guidelines. The subsequent part of this research will evaluate the impact of pharmacist involvement in the management of patients with suspected HIT.
Conference Abstracts  
May 16-18, 2022

Presenter Name: Uttaro, Elizabeth  
Organization: University of Rochester Medical Center  
Category: Cardiovascular/Critical Care  
Day | Session | Room | Time: Wednesday | 5 | Crystal B | 1:30:00 PM

Authors: E. Uttaro, J. Clark, M. Brown, J. Falvey

Title: Use of four-factor prothrombin complex concentrate for the management of bleeding not associated with anticoagulation

Objectives: Bleeding can occur from a variety of different sources including both congenital and acquired conditions such as Von Willebrand disease, hemophilia, cirrhosis, malnutrition, surgery, trauma, and disseminated intravascular coagulation (DIC). Bleeding events can result in significant morbidity and mortality. Outside of replacing blood losses with blood products and reversing anticoagulation if present, there remains a question about the best way to further correct coagulopathies. The purpose of this study was to describe the use of four-factor prothrombin complex concentrate (4FPCC) and the effect on coagulopathic bleeding not associated with anticoagulation.

Methods: This was a single-center, retrospective observational study of adult patients who received 4FPCC at University of Rochester Medical Center Strong Memorial Hospital between June 1st 2019 and July 31st 2021. Patients were excluded if they received warfarin, apixaban, rivaroxaban, dabigatran, betrixaban, or edoxaban within 72 hours prior to 4FPCC administration. In addition, patients who received 4FPCC prior to procedures without associated bleeding and those with baseline hemophilia disorders were excluded. The primary outcome is total blood product usage 12 hours before and 12 hours after the first 4FPCC administration. Secondary endpoints include assessment of bleeding via chest tube and drain output, occurrence of returning to the operating room for surgical repair of bleeding, intra-operative blood loss, and occurrence of a procedure required for hemostasis. Data will be reported using descriptive statistics, including central of tendencies to describe the population and outcome variables.

Results: Patient demographics, blood product use, laboratory data, hemostatic agent administration, mortality, and thromboembolic events before and after administration of 4FPCC will be reported.

Conclusions: It is anticipated this study will characterize the use of 4FPCC at our institution in the setting of coagulopathic bleeding.
Use of four-factor prothrombin complex concentrate for the management of bleeding not associated with anticoagulation

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Systemic Thrombolysis versus Catheter Directed Thrombolysis in Acute Pulmonary Embolism

**Objectives:** Studies have justified the use of thrombolytic therapy for acute pulmonary embolism (PE) in patients who meet specific criteria. Evidence describing the optimal dosing and administration strategy for the treatment of PE is limited. The 2021 American College of Chest Physicians (CHEST) guidelines briefly elaborate on recommendations for the method of thrombolytic therapy. In patients with acute PE who are treated with a thrombolytic agent, systemic thrombolytic therapy using a peripheral vein is preferred over catheter directed thrombolysis. The CHEST and the European Society of Cardiology guidelines list several instances where catheter directed therapy is preferred to systemic thrombolysis. No randomized control trial has compared systemic versus catheter directed thrombolysis in patients with acute PE. Recommendations supporting one method over the other are built upon a low certainty of evidence and classified as weak. The purpose of this study is to describe the use of PE thrombolysis in a large integrated health care system, specifically looking at method of thrombolysis and impact on outcome.

**Methods:** This study is a retrospective chart review of patients who received alteplase for acute PE within Geisinger. Subjects were stratified into two groups: systemic administration of alteplase (SAA) and catheter directed administration of alteplase (CDT). The primary outcome assessed was in-hospital mortality. Data was gathered via the electronic medical record where chi-square tests were used to analyze and evaluate categorical data, and unpaired t-tests were used to analyze and evaluate continuous data. Statistical significance was set at a p-value of 0.05.

**Results:** Of the 280 subjects who met inclusion criteria, 131 subjects were stratified into the SAA group, and 152 subjects were in the CDT group. The SAA group had a higher incidence of in-hospital mortality compared to the CDT group (24 vs 11, p=0.0047). Within the subgroup analysis, where systemic alteplase administration utilized during active cardiac arrest was removed from the analysis, there was no difference in in-hospital mortality between the two groups (15 vs 11, p=0.155).
**Conclusions:** There was no difference in in-hospital mortality between SAA and CDT for the management of patients with acute PE. There are logistical advantages to SAA along with similar incidences of in-hospital mortality and bleeding between the two modalities of thrombolytic administration for acute PE patients.
Practices and outcomes associated with buprenorphine use in a critically ill population

**Presenter Name:** Vanini, Denis  
**Organization:** University of Rochester Medical Center  
**Category:** Cardiovascular/Critical Care  
**Day | Session | Room | Time:** Wednesday | 5 | Crystal B | 2:00:00 PM

**Authors:** Denis Vanini, Jenna Clark, Kaylee Maynard, Raquel Jones, Stephen Rappaport, Rachel Schult

**Title:** Practices and outcomes associated with buprenorphine use in a critically ill population

**Objectives:** Buprenorphine is commonly used for management of opioid use disorder (OUD) and may have a role in iatrogenic opioid withdrawal. There is a lack of literature describing its place in therapy in critically ill patients. The purpose of this study is to describe how buprenorphine is used and outcomes associated with its use in this population.

**Methods:** This is a retrospective review of patients that received at least one dose of buprenorphine while admitted to any adult ICU at a large academic medical center over a five-year period. Subjects were excluded if they received only intravenous or transdermal buprenorphine or if they received sublingual or buccal buprenorphine with a target dose of less than 1 mg daily. Primary outcomes included frequency of indications for buprenorphine, time to first dose in the ICU, frequency of inductions used (institution specific standard or microinduction), and final dose reached during induction. Secondary outcomes included ICU and hospital lengths of stay, description of delays in therapy, total time on mechanical ventilation after first buprenorphine dose, and the difference in 24-hour morphine milligram equivalents (MME) before the first dose and after reaching the target dose of buprenorphine.

**Results:** A total of 153 patients were included. Median age was 39 years (IQR 32-52), 54% were male, and 84% had a history of OUD. The majority of admissions were medical (77%) or trauma-related (18%). Primary indications for buprenorphine in the ICU included OUD (86%), iatrogenic opioid dependence (7%), or pain (7%). Approximately half (49%) of our population used buprenorphine prior to admission. Patients received their first doses at a median of 2 days (IQR 1-5) into their ICU admission. Ninety-five patients that were buprenorphine-naïve or had an interruption in buprenorphine therapy required induction; 60% had a standard induction and 40% underwent microinduction. Precipitated withdrawal occurred in one patient that received a standard induction. In patients that received a microinduction, median 24-hour MME pre- and post-induction were 1058 (IQR 380-1470) and 263 (IQR 30-879, p<0.005), respectively. Patients with OUD started on buprenorphine > 48 hours from admission required more inductions (48% vs 91%, p<0.005) and toxicology consults (80% vs 100%, p<0.005). Buprenorphine treatment was continued in a majority of patients (79%) at hospital discharge.
**Conclusions:** Buprenorphine can be safely and effectively used in critically ill patients. In patients concurrently receiving opioids, buprenorphine microinduction was associated with a decrease in full-agonist opioid exposure after completion. Further studies are warranted in this population.
Conference Abstracts  
May 16-18, 2022

Presenter Name: Weaver, Cassidi
Organization: Penn Presbyterian Medical Center
Category: Cardiovascular/Critical Care
Day | Session | Room | Time: Tuesday | 4 | Crystal B | 3:45:00 PM

Authors: C. Weaver, L. Schmidt, V. Prendergast, M. Zielke, N. Martin

Title: Implementation of a pharmacist-driven anti-Xa monitoring protocol in trauma intensive care patients receiving enoxaparin chemoprophylaxis

Objectives: Current guidelines recommend the use of standard fixed dose enoxaparin for chemoprophylaxis in trauma patients, as they are at higher risk of deep-vein thrombosis and pulmonary embolism. However, literature suggests implementation of an anti-Xa monitoring protocol to adjust enoxaparin doses achieves higher rates of target levels to subsequently decrease the risk of developing venous thromboembolism (VTE). The purpose of this study was to characterize the incidence of sub-prophylactic anti-Xa levels in trauma patients receiving standard fixed dose enoxaparin for chemoprophylaxis.

Methods: This was a single-center quality improvement initiative conducted from January to September 2021 at a Level 1 Trauma Center. Patients were included if they were admitted due to acute trauma to the Trauma-Surgical Intensive Care Unit and initiated on enoxaparin chemoprophylaxis with at least one subsequent, steady-state peak anti-Xa level. Within the pharmacist-driven protocol, pharmacists ordered appropriately timed peak anti-Xa levels, interpreted levels to make enoxaparin dose adjustments, and continued to monitor levels until a target level (0.2-0.5 IU/mL) was obtained. The primary outcome evaluated the incidence of patients whose anti-Xa level was <0.2 IU/mL on enoxaparin 30mg every 12 hours. Secondary outcomes evaluated the dose of enoxaparin (fixed and weight-based) achieving a target anti-Xa level, the number of levels collected per patient, incidence of VTE, and major bleeding events.

Results: A total of 148 patients met inclusion criteria, of which 86 (58.1%) patients had a sub-prophylactic anti-Xa level (<0.2 IU/mL) on our institution’s standard fixed dose of enoxaparin 30 mg every 12 hours. Ninety-three (62.9%) patients had only 1 anti-Xa level drawn. Of the 95 patients who achieved a goal peak anti-Xa level, 31 (32.6%) patients required enoxaparin 40 mg every 12 hours to achieve the target anti-Xa level. Patients achieving target anti-Xa levels required a median weight-based dose of 0.47 mg/kg. Major bleeding was not observed in this study and 8 (5.4%) patients had a VTE while on enoxaparin chemoprophylaxis.

Conclusions: Standard fixed dose of enoxaparin chemoprophylaxis in trauma intensive care patients did not achieve target prophylactic anti-Xa levels in most patients. A pharmacist-driven protocol for monitoring anti-Xa levels can help ensure appropriate enoxaparin regimens in trauma patients who have an increased risk of thromboembolism. Starting trauma patients on
enoxaparin 40mg every 12 hours for chemoprophylaxis may lead to higher rates of achieving target anti-Xa levels. However, using a weight-based dose of 0.5mg/kg may be an effective, alternative approach, as our results of the weight-based dose needed to achieve target anti-Xa levels are consistent with previous studies.
Pharmacist-led warfarin dosing in post-cardiac surgery patients

**Authors:** J. Wu, R. Guiang, K. Torppey, D. Serao, P. Jen

**Title:** Pharmacist-led warfarin dosing in post-cardiac surgery patients

**Objectives:** Anticoagulant pharmacotherapy is essential in the management of post-cardiac surgery patients, with warfarin being the cornerstone agent prescribed. As a high-alert medication, warfarin carries the potential for causing serious injury and its use requires individualized, patient-specific dosing, routine laboratory monitoring, and consideration of drug interactions. The current practice of dosing warfarin in post-cardiac surgery patients at the study institution is variable, owing to differences in the approach of individual practitioners. The primary objective of this study was to evaluate the impact of pharmacist-led warfarin management for post-cardiac surgery patients.

**Methods:** This Institutional Review Board-approved study evaluated adult post-cardiac surgery patients newly initiated on warfarin in two phases—a retrospective medication use evaluation from January 1, 2019 to October 31, 2021 (Phase I) and a prospective pilot study from November 15, 2021 to April 30, 2022, in which a pharmacist recommended warfarin dosing daily to the prescriber by assessing the patient's health status, target INR, daily laboratory parameters, and drug-drug interactions (Phase II). The primary endpoint of the study was the proportion of time in therapeutic range. Secondary endpoints included other assessments of appropriateness of warfarin prescribing, clinical outcomes, and rate of safety events. Data was analyzed using descriptive and univariate statistics.

**Results:** Proportion of time in therapeutic range and data for secondary endpoints will be recorded and results will be presented.

**Conclusions:** It is anticipated that this study will demonstrate the benefits of pharmacist-led warfarin dosing in improving anticoagulation efficacy and clinical outcomes in post-cardiac surgery patients.
The impact of a newly implemented multicomponent sleep-promoting protocol on delirium in critically ill patients

Objectives: Sleep deprivation is reported in nearly 80% of patients in the intensive care unit (ICU) and is associated with acute mental status changes, neurocognitive dysfunction, and delirium. The 2018 Pain, Agitation, Delirium, Immobility, and Sleep (PADIS) guideline recommends the implementation of a multicomponent sleep-promoting protocol in critically ill patients. Literature suggests that sleep protocols may increase the quantity and quality of sleep in the critically ill population and may decrease the incidence of delirium and coma-free days in the ICU. Our objective is to develop and implement a multicomponent, multidisciplinary, sleep-promoting protocol and analyze its’ impact on delirium in intubated and non-intubated critically ill patients in the medical and surgical ICUs.

Methods: Nursing staff will incorporate non-pharmacologic interventions into their daily workflow, while ICU pharmacists will complete prospective patient chart reviews with aim to reduce exposure to medications with deliriogenic properties and assess the patient's need for a pharmacological sleep aids after non-pharmacological interventions have been successfully implemented and have failed. The study will involve pre-implementation education and protocol development, and post-implementation analysis. The primary outcome is ICU delirium-free days pre- and post-implementation. Secondary outcomes are administration of pharmacologic sleep aids, ICU length of stay, duration of mechanical ventilation, and accepted medication interventions made by a pharmacist.

Results: Results of this study will describe if ICU delirium-free days defined as a 24-hour period with an Intensive Care Delirium Screening Checklist Score <4, will be impacted by the implementation of a multicomponent, multidisciplinary, sleep-promoting protocol.

Conclusions: It is anticipated that this project will demonstrate a role for a pharmacist-driven sleep promoting protocol to increase the incidence of delirium-free days in intubated and non-intubated critically ill patients.
Impact of prophylactic bowel regimens in the intensive care unit for patients on opioid infusions

**Objectives:** Opioid-induced constipation (OIC) has been associated with negative outcomes in patients in the intensive care unit (ICU) setting. There is data to support that OIC results in an increased incidence of bacterial infections, increased ICU length of stay (LOS), increased hospital LOS, and increased overall mortality. However, there is no data available regarding the efficacy of prophylactic bowel regimens in reducing the incidence of OIC in this patient population. The objective of this study was to assess the incidence of OIC in medical ICU patients who received continuous intravenous (IV) opioid infusions and received prophylactic bowel regimens compared to those who did not.

**Methods:** This Institutional Review Board-approved retrospective chart review assessed patients 18 to 89 years old admitted to the medical ICU who received IV opioid infusions for at least five days between January 1, 2019, to September 30, 2021, at a tertiary hospital. Patients were excluded if they received opioid infusions for comfort measure purposes, received lactulose for any indication excluding constipation, had a history of gastrointestinal disorders, or were chronic opioid users. The primary outcome was the incidence of OIC in patients who received prophylactic bowel regimens compared to those who did not. OIC was defined as fewer than 3 bowel movements within a 7-day period from initiation of an opioid infusion. Prophylactic bowel regimen was defined as the incorporation of a scheduled stimulant or osmotic laxative within 24 hours of initiation of an opioid infusion. Secondary outcomes included time to first bowel movement, time to first laxative use, ICU LOS, hospital LOS, overall mortality, need for methylnaltrexone, need for manual disimpaction, diarrhea after initiation of laxative, and need for promotility agents.

**Results:** Of the 93 patients included, 48 patients received a prophylactic bowel regimen and 45 patients did not. Patients who received prophylactic bowel regimens had a significantly lower incidence of OIC compared to the control group (20.8% vs. 53.3%, p=0.001). There were no significant differences in ICU or hospital LOS, overall mortality, time to first bowel movement, or incidence of diarrhea after initiation of laxative agents between groups. There were no differences in the administration of methylnaltrexone, promotility agents, or manual disimpaction.
**Conclusions:** The results of this study suggest that prophylactic bowel regimens reduce the incidence of OIC in patients receiving IV opioid infusions in the ICU setting. This study was limited due to small sample size and retrospective design.
**Conference Abstracts**  
May 16-18, 2022

**Presenter Name:** Zied, Joseph  
**Organization:** Jefferson Health New Jersey  
**Category:** Cardiovascular/Critical Care  
**Day | Session | Room | Time:** Tuesday | 3 | Empire A | 1:30:00 PM

**Authors:** J. Zied, A. Fryckberg, N. Vyas, S. Ali

**Title:** Comparing moderate dose versus high dose dexamethasone for the treatment of novel coronavirus infection in intensive care units

**Objectives:** Several recent studies have investigated the role of dexamethasone in treating symptomatic SARS-CoV-2 (COVID-19) infections among different patient populations with varying results. The primary objective of this study is to investigate whether patients with COVID-19 in an intensive care unit who received high dose dexamethasone had improved inpatient mortality when compared to patients who received moderate dose dexamethasone at our health system. Secondary outcomes include progression to invasive mechanical ventilation and the development of secondary infections in these patients.

**Methods:** This study was a retrospective chart review of patients with COVID-19 at a multicenter community teaching health system who were treated with dexamethasone. Patients were included in the study if they had a confirmed COVID-19 infection via a nucleic acid amplification (NAA) test, were admitted to an intensive care unit, and received more than one consecutive day of either intermediate (greater than or equal to 2 mg daily to less than or equal to 6 mg daily) or high dose (greater than 6 mg daily) dexamethasone. Patients were excluded if they were mechanically ventilated at the time of steroid initiation or if they have been receiving chronic corticosteroids prior to admission.

**Results:** The treatment outcomes for patients who were treated with both moderate and high dose dexamethasone will be presented.

**Conclusions:** It is anticipated that this project will add to the body of current literature of dexamethasone utilization and dosing for patients who are critically ill with COVID-19.
Conference Abstracts  
May 16-18, 2022

Presenter Name: Adadey, Chiamaka  
Organization: Walgreens, Howard University College of Pharmacy  
Category: Community Practice  
Day | Session | Room | Time: Monday | 1 | Empire B | 2:00:00 PM

Authors: Chiamaka S. Adadey, PharmD, Tamara McCants, PharmD, William Dropppleman, RPh, La'Marcus Wingate, PharmD, PhD, Careen-Joan Franklin, PharmD

Title: Pharmacy Personnel Perceptions of the Applicability of the American College of Clinical Pharmacy (ACCP) Template for Evaluating a Clinical Pharmacist in the Community Pharmacy Setting

Objectives: The purpose of this study is to identify community pharmacy personnel's perceived applicability of the American College of Clinical Pharmacy (ACCP) Template for Evaluating a Clinical Pharmacist competency domains in the community pharmacy setting. In 2016, the ACCP developed a template for evaluating a clinical pharmacist's performance in any practice setting. About half of practicing pharmacists work in the community pharmacy setting. As third-party reimbursements shift to a pay-for-performance model, there are increasingly more community pharmacists offering clinical care to patients. The applicability of this template in the community pharmacy setting is not known.

Methods: A deidentified electronic questionnaire shared via email will ask respondents to indicate their perception of each ACCP template's competency domain-defining task as a reasonable expectation of a community pharmacist, using a five-point Likert scale. Respondents will include community pharmacy interns, staff pharmacists, pharmacy managers, and district and area managers of a large chain pharmacy in the District of Columbia metropolitan area. The questionnaire will collect as covariates, respondent demographics including gender, role in pharmacy, years of community pharmacy experience, combined work experience, degrees and certifications held, average number of prescriptions filled per day at the pharmacy, and clinical services offered at the pharmacy. The primary endpoint is the mean average score for each competency domain assessed by applying descriptive statistics to responses from the Likert scale. The secondary outcome is an assessment of relationships between the perceived applicability of the competency domains and respondent demographics using a multivariate linear regression analysis.

Results: N/A

Conclusions: N/A
Title: Implementing a social determinants of health program through the lens of a Western New York community pharmacy

Objectives: The primary objective of this study is to evaluate the implementation of a social determinants of health (SDoH) program in the community pharmacy setting.

Methods: This is a single-center, retrospective study evaluating the implementation of a community pharmacy SDoH program in Western New York. Eligible patients were: 1) identified through a trigger form utilized by SDoH trained pharmacy staff, 2) screened and assessed by a community health worker (CHW) 3) referred to appropriate social services through an online platform and additional external mechanisms, and 4) followed-up with to ensure social needs were met. We will then follow-up with the patient after a completed intervention to determine the program’s effectiveness in addressing the patient’s social needs.

Results: Data collection is ongoing. Currently, 30 patients have been identified and enrolled in the pilot program via trigger form completion. The majority of patients were black (n=20, 66.7%), female (n=24, 80%), single (n=17, 56.7%) and enrolled in Medicaid (n=21, 70%). The most prevalent social challenges identified were stable housing (n=16, 20.3%), utility affordability (n=12, 15.2%), food affordability (n=11, 13.9%) and transportation (n=11, 13.9%). Almost half of patients (n=12, 40%) were found to have 3 or more SDoH challenges. 21 of the 30 patients marked on the trigger form that they were open to receiving assistance, and were therefore screened and assessed by the CHW. After screening the 21 patients, 13 were referred to additional resources. Four (30.8%) of these patients required 1 resource, followed by 3 (23.1%) requiring 4 resources, 2 (15.4%) requiring 2 resources, 2 (15.4%) requiring 3 resources, and 2 (15.4%) requiring 5 resources. All cases requiring follow-up are still open and thus data analysis cannot be completed at this time. Time to complete initial workflow steps from screening through referral averaged 17.7 ± 15.6 minutes.

Conclusions: Implementation of a SDoH program in a community pharmacy demonstrated progress. Ultimately, integrating these programs into community pharmacy settings through direct referrals and patient engagement is necessary to address SDoH for at-risk individuals.
Presenter Name: Dieu, Isabelle  
Organization: Big Y Pharmacy and Western New England University  
Category: Community Practice  
Day | Session | Room | Time: Monday | 1 | Empire B | 12:30:00 PM  

Authors: Isabelle Dieu, PharmD, Natalia Scherbakova, PhD, MS, Maria Charbonneau, PharmD, Katelyn Parsons, PharmD, BCACP, Kam Capoccia, PharmD, BCPS, CDCES  

Title: Marijuana use among people with diabetes: A qualitative focus group study  

Objectives: The objective of this study is to evaluate the patterns and reasons for marijuana use among people with diabetes in an outpatient clinic setting.  

Methods: This focus group study will evaluate the patterns of marijuana use among adults with diabetes. Inclusion criteria include English-speaking people with diabetes who are 18 years or older, and who currently use or have used marijuana related to their diabetes. Invited participants may be people with diabetes who are seen at the Consultation and Wellness Center, referred by a peer or health care provider, or through social media outlets. Each focus group will contain 4-6 participants with four groups in total. Patient demographics such as age, race, sex, and level of education will be collected via a paper questionnaire. These focus groups will be held at the WNE Consultation and Wellness Center in Springfield, Massachusetts, or on Zoom, depending on the weather and availability. The sessions will be recorded via the Otter application and transcribed via Word. During these meetings, the investigators will facilitate discussions between participants. Topics of discussion will be centered around use of marijuana, methods of consumption, and rationale for consumption.  

Results: The first focus group included both male and female participants aged 51 to 75, diagnosed with both type 1 and type 2 diabetes. The participants reported that marijuana was primarily consumed to help manage other disease states or for recreation. Two of the participants reported marijuana use for sleep and pain management due to sciatica. The main methods of consumption reported were smoking and edibles, both in gummy and baked forms. Only one of the participants in the first group had a medical marijuana card and was evaluated for its use medically. The participants reported that there is still significant stigma against people who consume marijuana and state that it can sometimes be difficult to openly discuss. Participants acquire marijuana from various sources, ranging from growing it to obtaining it from local dispensaries and friends. Participants reported no change in ability to appropriately manage diabetes, stating that marijuana use overall neither negatively nor positively affected blood glucose management. Participants who used marijuana for pain management and sleep reported that overall quality of life and health have improved since starting use of marijuana.
**Conclusions:** These findings suggest that marijuana use neither negatively nor positively impacted blood glucose management. There are a multitude of potential therapeutic indications for marijuana use including pain management and sleep and the methods of consumption and avenues of procuring marijuana vary from person to person.
**Conference Abstracts**  
May 16-18, 2022

**Presenter Name:** Gilk, Paige  
**Organization:** Albertsons Companies. University of Maryland School of Pharmacy.  
**Category:** Community Practice  
**Day | Session | Room | Time:** Monday | 1 | Empire B | 1:30:00 PM

**Authors:** Paige Gilk, PharmD, AAHIVP, Krista Hein, PharmD, AAHIVP, Hyunuk Seung, MS, Jeffrey Hamper, PharmD, BCACP, Eric Kim, PharmD, Cherokee Layson-Wolf, PharmD, BCACP, FAPhA

**Title:** Evaluation of advanced pharmacy practice experience student readiness and willingness in community-based medication administration

**Objectives:** Pharmacists can administer medications other than immunizations in all but four states and the District of Columbia. Boards of pharmacy approval and limited training programs are potential barriers to providing the service. Evaluating Advanced Pharmacy Practice Experience (APPE) student readiness and willingness to provide medication administration services in a community setting may identify a need for further medication administration training.

**Methods:** A Qualtrics survey, consisting of student demographics, readiness, and willingness questions, was distributed to 145 experiential learning offices to send to APPE students across the United States (U.S.) via email. Current APPE students were included in the evaluation, whereas graduates were excluded. Data analysis included descriptive statistics for frequencies, a chi-square or Fisher's exact test for associations of frequency distribution, and a Fisher's exact test with Bonferroni correction for multiple comparisons.

**Results:** Demographic results include 59.1% of students attending pharmacy school in the Southeast U.S., 64.3% working in community pharmacy, and 52.8% pursuing residency post-graduation. Gaps in training were identified such as 75.1% of students were already trained to administer intramuscular (IM) and subcutaneous (SQ) immunizations compared to 4.4% for ventrogluteal (VG) medications. Also, 79.7% already administered IM and SQ immunizations whereas 2.8% for VG medications. Statistically significant results include 30.3% of students in the Southeast already administered IM and SQ medications compared to 3.5% in the Midwest (adjusted p=0.01). Although 35% of students disagreed with having sufficient training at school or work experience to administer medications other than immunizations, 61% are willing to administer after training and 70% prefer to be trained by their pharmacy school. Study limitations include most responses coming from the Southeast, which is where the research study originated, and pharmacy schools were not surveyed on whether their curriculum provides medication administration training. Students identified multiple barriers to providing this service in the pharmacy.
Conclusions: Student willingness to provide this service is high however, there are opportunities to increase student readiness. A significant gap in training contributed to most students not being ready to administer medications. Incorporating medication administration training into the pharmacy curriculum may help increase APPE students' readiness to administer in the community setting.
Title: Pharmacist driven text-based survey network pilot project for public health and legislative advocacy opportunities

Objectives: Current pharmacist engagement strategies rely on state association membership, which can incorporate participant selection bias and limit generalizability. The utilization of a mass texting messaging platform offers a new means of information dissemination. The objective is to create a self-sustaining, long-lasting advocacy platform for pharmacists to be operated by future PGY1 Community-Based Pharmacy Residents, preceptors, faculty, and Doctor of Pharmacy students. Goals of the survey network are to recruit and inform network pharmacists regarding proposed legislation and advocacy opportunities throughout Rhode Island.

Methods: The pilot phase of this survey network will consist of 30 pharmacists from 10 Walgreens pharmacies throughout Rhode Island. Selection of pharmacies will be based on geographic location, rurality, patient population, diversity, daily prescription count, and clinical services offered. Initial enrollment for pharmacists will take place during an in-person recruitment visit at the pharmacy. Investigators will educate the pharmacists during these visits. Pharmacists will send a one-word keyword to the text messaging program’s number or scan a QR code directing them toward enrollment. The enrollment process will be designed with efficiency and simplicity in mind so as to not take away from the pharmacists already busy workflow. Text messages from the platform will consist of advocacy information as it becomes available and relevant. Opportunities for testimony about bills introduced to the Rhode Island legislature will be made known to enrolled pharmacists. Descriptive statistics will be used to evaluate differences in engagement and responses from pharmacists in their respective pharmacy settings.

Results: At present, the network has enrolled 15 community pharmacists from seven unique Walgreens pharmacies. The network has sent 82 text messages since December 2021. The average time to respond within 24 hours of receipt of a message is 84 minutes with 73% of replies occurring within 24 hours. Of those responses within 24 hours, 80% were received within two hours. To date, there have been zero pharmacists who have unenrolled from the text messaging network.
**Conclusions:** Pharmacist engagement with a mass text message service may provide insight into the types of services pharmacists may advocate for and implement into their practice. Reducing professional isolationism and providing an independent source of advocacy and legislative information will promote further opportunities for pharmacists to promote and have a voice in the future of their profession. Current results suggest the majority of enrolled pharmacists are responding to messages from the network. Additionally, the average time to reply to messages indicates enrollees will, on average, reply within two hours. Nearly 48 million Americans opt in to receive text messages from businesses and other entities, further supporting this platform as a viable, sustainable method for communication with network enrollees.
**Evaluation of implementation strategies and community pharmacist’s perceived readiness to incorporate pharmacogenomics services into community pharmacy workflow**

**Objectives:**
Personalized medicine has long been a goal of the healthcare system, and with the advent and adoption of pharmacogenomics, one that has become increasingly plausible. Pharmacogenomics services have expanded rapidly over the last decade with the Food and Drug Administration (FDA) listing almost 300 medications with actionable gene-drug interactions and Clinical Pharmacogenetics Implementation Consortium (CPIC) issuing over 100 guideline-based recommendations on gene-drug pairs. While individualized medicine is associated with positive outcomes, best practices have not been established for incorporating pharmacogenomic services into the healthcare system. Community pharmacists are positioned to make impactful targeted therapy recommendations for patients if pharmacogenomic services were to be effectively incorporated into their workflow. The primary outcome is to understand community pharmacists’ perspectives on the successful implementation or expansion of pharmacogenomics services into workflow. The secondary outcome is to determine potential differences in community pharmacists’ abilities and willingness to recommend or implement pharmacogenomics services across disease states.

**Methods:**
This study will utilize a nationwide, anonymous, electronic survey of currently licensed and practicing community pharmacists. The survey consists of a variety of question types, including binary, Likert scale, and multiple-choice questions. It will assess implementation methods including screening, pharmacy software alerts, and patient-initiated interactions to implement or enhance pharmacogenomics services. The primary objective will evaluate both perceived effectiveness and pharmacists’ willingness to utilize the various methods being proposed. Assessment of the secondary outcome will detect differences in pharmacists’ comfort in recommending or implementing pharmacogenomic services across several disease states. Funding from the APhA Foundation has been obtained to use for an optional incentive raffle for participants. Demographic and education information of the responding pharmacists will be used to perform subgroup analyses of the data. The primary objective will be evaluated using descriptive statistics. The secondary objective will use descriptive statistics and Chi-squared testing to analyze between group differences.
**Results:** Data collection is currently ongoing. The survey outcomes and subgroup analyses of the data will be presented.

**Conclusions:** The collection and assessment of this data will create generalizable information on methods for implementation of more robust pharmacogenomics services in the community pharmacy practice setting. This will allow pharmacists to make informed decisions regarding implementation and breadth of a pharmacogenomics service, with the ultimate goal to increase patient care and optimize outcomes.
Impact of an internal specialty pharmacy medication assistance program on the adherence rates of oral oncolytics

Objectives: The high cost of medications poses a barrier to adherence which, in turn, results in poor therapeutic outcomes and an increase in overall avoidable health spending. Medication adherence is critical, especially in cancer patients, in order to achieve optimal, progression-free and disease-free survival. However, the projected cost of cancer continues to rise, putting patients at a greater risk for delayed treatment and nonadherence. This study evaluates the impact financial assistance has on medication adherence by comparing the oncolytic adherence rates found in published literature with the rates found in patients receiving financial assistance through an internal specialty pharmacy.

Methods: This was a single-center, retrospective chart review evaluating patients over 18 years of age who received Hisaoka Cancer Fund and filled their oral oncolytic medications with the internal health system specialty pharmacy. The outpatient pharmacy software and electronic health records were utilized to run reports based on the eligibility criteria between January 1, 2020 and June 30, 2020. Patient demographics included age, gender, race, and cancer diagnosis, name of medications, prescription fill dates, prescription dispensed dates, total days’ supply, and last fill days’ supply. Patients younger than 18 years of age, who filled injectable oncolytics or supportive medications, had unavailable or incomplete data, or were on off-label prescription drugs were excluded. The medication possession ratio (MPR) and time-to-treatment (TTT) in patients receiving the fund were compared to adherence rates found in the literature.

Results: A total of 167 patients with a total of 297 prescription fills were evaluated, but only eight patients filled oral oncolytics at least two times through the internal specialty pharmacy during the study period. The MPRs had an average of 82.8% with a median of 92.8% (range 53.8% – 100%). The average TTT was 1.1 days, with a median of 0 day (range 0 – 12 days). In contrast, MPRs found in the two published studies had 75% and 61%, respectively and TTTs were found to be 10.9 and 27 days in those who filled medications through an external specialty pharmacy. A total of $12,793.43 was covered by the fund, with an average of $1,599.18 per patient during the six-month period.
**Conclusions:** Adherence rates in patients who received the medication assistance program through internal health system specialty pharmacy exceeded the rates found in patients who filled medications from external pharmacies. The Hisaoka Fund reduced the financial burden by covering the cost of medications. Due to the limited number of patients, further studies are needed to evaluate the impact of the medication assistance program on adherence rates across institutions.
Joshi, Avani
Assessment of knowledge of patients with diabetes on the impact of nutrition on disease state management

Conference Abstracts
May 16-18, 2022

Presenter Name: Joshi, Avani
Organization: Albertsons Companies
Category: Community Practice
Day | Session | Room | Time: Tuesday | 4 | Empire B | 3:15:00 PM

Authors: A. Joshi, M. Gurney, J. Dang, J. Hamper

Title: Assessment of knowledge of patients with diabetes on the impact of nutrition on disease state management

Objectives: In the U.S., patients visit their community pharmacy almost twice as much as their primary care physician. Due to this frequent interaction with their patients, community pharmacists can play an integral role in disease education and management. The primary objectives of the study are (1) to assess the knowledge of patients with type 1 and type 2 diabetes on how diet impacts their disease state management, (2) to determine what nutritional services patients with diabetes want from community pharmacists, and (3) how community pharmacists can better facilitate healthy eating for these patients.

Methods: The project will use a qualitative phenomenological approach. The inclusion criteria for the study are people aged 18 to 85 years old, diagnosed with type 1 or type 2 diabetes, and fluent in English. The exclusion criteria are people less than 18 years of age, more than 85 years old, pre-diabetics, and those who are not fluent in English. A flyer for the study inviting patients who are diagnosed with diabetes to participate in a semi-structured interview will be distributed with each anti-hyperglycemic medication dispensed at five supermarket-based community pharmacies. The flyer will instruct those interested to complete a screening questionnaire that will collect demographic information and determine if they qualify to participate in the study. Twenty-five participants will be interviewed via Microsoft Teams where the participants will be asked about their current eating patterns, what aspects of diet management they struggle with, and what resources community pharmacists can offer to help. The interviews will be audio-recorded and transcribed verbatim. The analytical software Dedoose® will be used to perform a thematic analysis of the interviews.

Results: Data collection is in process and results will be presented at the conference.

Conclusions: The investigators hypothesize that the people with diabetes with low access to healthcare and those who are unaware of the complications that uncontrolled diabetes can cause may be less knowledgeable about how nutrition affects their disease state compared to those with type 2 diabetes who have a larger healthcare team that includes a nutritionist or registered dietitian. The investigators predict that those with diabetes will be excited about the idea of community pharmacists offering nutritional guidance.
Conference Abstracts
May 16-18, 2022

Presenter Name: Litvak, Isabelle
Organization: Wilkes University, Nesbitt School of Pharmacy, Weis Markets
Category: Community Practice
Day | Session | Room | Time: Monday | 1 | Empire B | 12:15:00 PM

Authors: Isabelle Litvak, PharmD, Nicole C Pezzino, PharmD, BCACP, CDCES

Title: Community pharmacists' perceptions on their role in counseling patients on lifestyle modifications

Objectives: The primary objective of the study is to identify community pharmacists' barriers and facilitators and determine strategies to provide lifestyle modification counseling in the community pharmacy. The secondary objective is to determine community pharmacists' level of comfort in providing lifestyle counseling.

Methods: This study utilized a mixed-methods approach. Community pharmacists practicing at a regional grocery store chain were invited to participate in a 20-question survey. The survey asked questions regarding time spent, level of comfort, encountered barriers, and their opinion on their role in lifestyle counseling. Descriptive statistics were utilized to analyze likert scale responses and demographic information. At the end of the survey, participants were invited to opt-in for an interview. Participants were randomly selected for a follow-up semi-structured interview to gain further perspective on their role in lifestyle counseling and examples of past encounters. The interviews were conducted and recorded over zoom then transcribed by study investigators. A codebook was developed and transcripts were coded. Thematic analysis was utilized for interviews and discrepancies will be resolved through discussions. This research received IRB approval in December 2021.

Results: One hundred and forty one (141) pharmacists participated in the survey yielding a 53.2% response rate. A majority of participants (82.3%) agreed that pharmacists are ideally positioned to provide lifestyle counseling to their patients. However, the majority of the participants reported doing lifestyle counseling never or less than quarterly for weight loss (65.6%), nutrition (52.8%), exercise (60%), and alcohol moderation (81.6%). The top three lifestyle counseling that pharmacists indicated they would practice compared to their reported comfort in each were the following: tobacco cessation (96% vs. 77.4%), exercise (87.1% vs. 58.1%) and alcohol moderation (84.7% vs. 59.7%). Participants noted the top three barriers to pharmacists offering lifestyle counseling were time (95%), workflow (59.6%), and patient willingness (53.2%). The next steps of this research project are the semi-structured interviews, which are underway and more results are pending.

Conclusions: Researchers hope to identify strategies for community pharmacists to be able to provide lifestyle counseling and to elevate the level of care for lifestyle modification counseling.
Based on the disconnect between pharmacist willingness and level of comfort, researchers can create resources and provide education to increase pharmacist level of comfort on lifestyle counseling.
Conference Abstracts  
May 16-18, 2022

Presenter Name: Loi, Allison  
Organization: Safeway Pharmacy and University of Maryland School of Pharmacy  
Category: Community Practice  
Day | Session | Room | Time: Tuesday | 4 | Empire B | 3:00:00 PM

Authors: Allison Loi, PharmD, Deanna Tran, PharmD, BCACP, Eric Kim, PharmD, Hyunuk Seung, MS, Krista Hein, PharmD, AAHIVP

Title: Evaluation of adherence to antiretroviral medications in a national grocery store chain pharmacy using proportion of days covered

Objectives: The primary objective of this study was to compare the proportion of days covered (PDC) for antiretroviral (ARV) medications for both human immunodeficiency virus (HIV) treatment and prevention in patients using HIV-focused pharmacies (HIV-FP) compared to non-HIV-focused pharmacies (non-HIV-FP) in a grocery store chain community pharmacy. The secondary objectives were to determine which factors impact adherence rates of ARV medications and the demographic information of patients using HIV-FP.

Methods: This was a retrospective study of deidentified prescription claims for patients filling any ARV medications from October 2018 to July 2021 at selected pharmacy locations. Patients 18 years and older who had fill records at a Safeway Pharmacy in the Washington D.C., Maryland, and Virginia area of at least two 30-day supply of ARV medication during the study period were included. Individuals with records of ARV medication fills at both pharmacy types or who were known to have died during the study period were excluded. Adherence was defined as PDC ≥95% and have less than a 5-day gap between fills if on a combination regimen.

Results: Of the 1,496 patients who met the inclusion criteria, 971 patients used an HIV-FP. The median age of patients who filled a prescription at an HIV-FP was 41 years old, 81.9% were male, with the majority from a pharmacy in Washington D.C. who used non-government insurance. The median PDC score of HIV-FP was higher than non-HIV-FP but was not statistically significant (97.1% vs. 96.6%, respectively, p=0.2). There was no association between PDC (â‰¥95% vs. <95%) and pharmacy type (HIV-FP vs. non-HIV-FP). However, there was an association between PDC score and medication use (prevention vs. treatment). A treatment patient was 1.59 times more likely to have a PDC score â‰¥95% compared to a prevention patient (OR=1.59, 95% CI = (1.18, 2.14)). Findings from a multivariate analysis of PDC scores showed that a non-government insurance patient was 1.91 times more likely to have a PDC score â‰¥95% than a government insurance patient.

Conclusions: Patients using this regional division grocery store chain pharmacy have a high PDC score regardless of pharmacy type, which may account for why there was no statistically significant difference. An area of focus includes increasing PDC to â‰¥95% in more patients.
Further research needs to be done to determine what other factors may impact adherence to ARV medications and the impact of greater adherence on clinical and economic outcomes.
Impact of prescription delivery service on patients receiving their influenza vaccine in the community setting

**Authors:** C. Quattrone, B. Abrahams, P. Melissen, L. Huynh, N. Rodriguez; ACME Sav-On Pharmacy, Temple University School of Pharmacy, Philadelphia, Pennsylvania

**Title:** Impact of prescription delivery service on patients receiving their influenza vaccine in the community setting

**Objectives:** Community pharmacists are major contributors to public health outcomes by providing vaccinations, including the yearly influenza vaccine. Data from the CDC credits community pharmacies with providing 35.4 million influenza vaccines during the 2019-2020 season. A 2020 poll by Axios-Ipsos shows that 1 in 5 Americans receive their prescriptions via delivery service, and new data indicates that the use of prescription delivery rose 20% during the COVID-19 pandemic. This study aims to determine if the reduction in trips to the pharmacy resulting from prescription delivery service will impact influenza vaccination rates.

**Methods:** This retrospective cohort study was conducted across two locations of a grocery store pharmacy chain located in Pennsylvania and included patients who received an influenza vaccine at these chain locations between August 2017 and February 2019. It was then determined which patients, in-person prescription pick-up and prescription delivery, returned for their influenza vaccine from August 2019 to February 2020 from these grocery store pharmacy locations utilizing data from the pharmacy software, Enterprise Pharmacy Systems (EPS). Descriptive statistics and quantitative data were measured with the mean if continuous and median if ordinal.

**Results:** Prescription delivery patients are utilizing the opportunity for influenza vaccine administration from their community pharmacy at similar rates as those who pick up their prescriptions in person.

**Conclusions:** Although prescription delivery patients returned for an influenza vaccine, an implication of this research is how to target delivery service patients who were excluded from the study due to lack of previous influenza vaccine for future immunizations.
Comparison of time within therapeutic range when a patient-specific nomogram versus a structured nomogram is utilized in outpatient warfarin management

Authors: J. Scott, C. Golden, T. Mullen

Title: Comparison of time within therapeutic range when a patient-specific nomogram versus a structured nomogram is utilized in outpatient warfarin management

Objectives: Warfarin dosing requires close monitoring of the international normalization ratio (INR) to achieve therapeutic goals. Dosing nomograms are used to provide dosing suggestions to achieve specific therapeutic goals however, clinicians often abandoned to use of dosing nomograms once dosing experience is gained. The purpose of this study was to evaluate whether a patient-specific warfarin dosing nomogram that incorporates a greater number of dosing adjustments lead to more time within therapeutic range (TTR) than a structured dosing nomogram.

Methods: This was cohort study evaluating the TTR for outpatients managed by two different warfarin dosing nomograms. Patients managed by pharmacists at our health system's outpatient clinic utilized the patient-specific nomogram while patients managed by our health system's Cardiology Consultants practice utilized a structured nomogram. The study evaluated TTR for outpatient warfarin patients managed by a structured dosing nomogram versus a patient-specific dosing nomogram as the primary outcome. Secondary outcomes of this study were safety events which included thrombosis, bleeding events, and death. Demographic and study data was collected through the electronic medical record.

Results: Demographic data along with the TTR using both patient-specific nomogram and structured dosing nomogram and safety events will be recorded and presented. Statistical analysis of collected data will be completed and reported.

Conclusions: It is anticipated that this study will determine the optimal warfarin dosing nomogram to achieve a greater TTR.
**Identifying patient barriers to declining naloxone prescriptions in the community pharmacy setting**

**Objectives:** In the state of Virginia, prescribers are required by law to issue a naloxone prescription when initiating opioid treatment for patients that have a prior history of overdose, substance misuse, opioid doses exceeding 120 morphine-milligram-equivalents (MME) per day, or concomitant benzodiazepine use. What the law fails to address is the responsibility of the patient to receive the naloxone. This means that a prescriber may send them a prescription for naloxone, but the patient has no obligation to pick up the prescription. The objective of this study is to determine major barriers for patients choosing to not pick up naloxone prescriptions in the outpatient pharmacy setting.

**Methods:** This will be a prospective, observational, survey study at an outpatient community pharmacy associated with a 495 bed community hospital. Patients were asked by the employee processing the transaction to complete a brief verbal survey regarding their reasoning behind declining to pick up their naloxone prescription. If patients declined to participate, it was noted as such. Results were collected at the close of business each day. Survey results were organized to show the most common to least common reason patients declined to pick up their naloxone prescription. Patients were eligible for inclusion if they had a naloxone prescription at Valley Pharmacy between November 1, 2021 and February 28, 2022 and they decline to pick up the prescription upon pickup. The primary endpoint is to identify the most common reason why a naloxone prescription is rejected by patients at pickup. The secondary endpoint is to identify additional reasons why a naloxone prescription is not picked up.

**Results:** The reasons for patients declining to pick up their naloxone prescription will be recorded and results will be presented.

**Conclusions:** It is anticipated that this project will demonstrate that there are a variety of barriers that need to be addressed as well as identify the need for enhanced education for both providers and patients to increase access to naloxone for our patients.
Objective: While there is robust data on the association between statins and muscle related adverse events, the effect of PCSK9 inhibitors on muscle related adverse events is not as well studied and the available data shows inconsistent incidence rates for muscle related adverse events. The objective of this study was to determine the percentage of patients that developed muscle related adverse effects while on a PCSK9 inhibitor in a pharmacy led patient aligned care team (PACT) clinic.

Methods: In this retrospective single center study, medical records of 137 patients at the Wilkes-Barre VA Medical Center who were prescribed a PCSK9 inhibitor between December 1, 2017 and September 1, 2021 were screened to identify patients who developed subsequent muscle related adverse effects. Veterans who did not meet the criteria for PCSK9 use, and those who had a history of a serious hypersensitivity to a PCSK9 inhibitor or rhabdomyolysis were excluded.

Results: Approximately 17% of the patients included developed a muscle related adverse effect while on a PCSK9 inhibitor. Data was further analyzed based on the following patient groups: patients on a PCSK9 inhibitor and tolerated full dose, tolerated alternative PCSK9 inhibitor following initial PCSK9 intolerance, required a dose reduction of PCSK9 inhibitor, or required discontinuation of PCSK9 inhibitor. In each of these defined groups, statin intolerance ranged from 68.1-100%, ezetimibe intolerance ranged from 41.6-83.3%, and both statin and ezetimibe intolerance ranged from 36.3-83.3%. Out of the 16 patients whose dose of PCSK9 inhibitor was reduced to monthly dosing, 68.6% did not reach their LDL goal. Management strategies for patients who did not reach their LDL goal included increasing the dose of monthly PCSK9 inhibitor in 36.7% of patients, switching to alternative PCSK9 inhibitor in 9.1% of patients, and lifestyle modifications were made in 54.5% of patients.

Conclusions: Results of this study showed that muscle related adverse effects to a PCSK9 inhibitor occurred at a similar incidence rate to that reported in previous clinical trials and exceeded the incidence rate reported in the package inserts for alirocumab and evolocumab. It also appears that patients who have a prior muscle related intolerance to a statin and/or ezetimibe have a higher likelihood of developing a muscle related adverse effect to a PCSK9 inhibitor. In our study, only one patient developed a muscle related adverse effect on a PCSK9 inhibitor.
inhibitor that did not have a prior history of muscle related intolerance to either a statin or ezetimibe.
Conference Abstracts  
May 16-18, 2022

Presenter Name: Barakat, Sami  
Organization: NewYork-Presbyterian Brooklyn Methodist Hospital  
Category: Disease State Management/Outcomes  
Day | Session | Room | Time: Wednesday | 5 | Empire B  | 12:30:00 PM

Authors: Sami Barakat, Pharm.D., Allison Stilwell, Pharm.D., BCIDP, Gary Wu, Pharm.D., BCPS-AQ ID, BCCCP, AAHIVP, BCIDP, Harold W. Horowitz, M.D., Erin Y. Oh, B.A., Pharm.D., BCPS-AQ Cardiology

Title: Evaluation of discharge antibiotic prescribing trends at a tertiary teaching hospital in Brooklyn, NY

Objectives: In 2019 The Joint Commission issued a requirement for ambulatory health centers to regard antimicrobial stewardship programs (ASP) as a priority and to develop and implement a dedicated program. Despite increased implementation of outpatient ASPs in recent years, there is a lack of evidence on the appropriate framework for implementation and the most effective interventions. In order to gauge the need for expansion of an ASP at a tertiary teaching hospital, the primary aim of this study is to evaluate discharge antibiotic prescribing trends and types of interventions made by the transitions of care and outpatient pharmacy services.

Methods: This is an institutional review board approved retrospective study evaluating adult patients who received at least one dose of an antibiotic while admitted and discharged in May 2021 with one or more oral antibiotic prescriptions for continued treatment of the same infection. The primary endpoint is the outpatient antibiotic indication, selection, and duration of therapy. Secondary endpoints include the pharmacist intervention(s) on discharge antibiotic prescription(s) and the type of interventions made by the transitions of care and outpatient pharmacy team (i.e. drug allergy, drug-drug interaction, dose adjustment, frequency change, limit duration of therapy).

Results: A total of 83 patients were included. The most common infections encountered were genitourinary, gastrointestinal, and skin and soft tissue. Compared to the inpatient setting, there was less beta-lactam (33.1% vs. 49.4%) but more fluoroquinolone (18.5% vs. 6.1%), tetracycline (7.8% vs. 3.1%), and sulfonamide prescriptions (7.8% vs. 1.8%) in the outpatient setting. The average duration of therapy was 9.9 days for urinary tract infection (UTI), 9.6 days for community-acquired pneumonia (CAP), and 13 days for cellulitis. Pharmacist interventions was recorded for 3.6% of outpatient prescriptions. Types of interventions included duration of therapy and dose modification.

Conclusions: Outpatient discharge prescribing trends demonstrated decreased utilization of beta-lactams compared to inpatient utilization. Patients treated for CAP, UTI, and cellulitis received, on average, longer duration of therapy than what is recommended by national

Barakat, Sami  
Evaluation of discharge antibiotic prescribing trends at a tertiary teaching hospital in Brooklyn, NY
guidelines. There is a need for expanded antimicrobial stewardship program services into the outpatient setting to ensure appropriate antibiotic selection and duration on discharge.
Impact of Pharmacist Intervention on Inhaled Corticosteroid De-escalation in Patients with Chronic Obstructive Pulmonary Disease

Chronic Obstructive Pulmonary Disease (COPD) is one of the most common causes of death in the world. It is characterized by consistent respiratory symptoms and airway limitation. The disease is a major cause of long-term morbidity and mortality as many patients with COPD die prematurely from its complications. According to the 2021 Global Initiative for Chronic Obstructive Lung Disease guidelines, medication treatment regimens need to be individualized for each patient. Inhaled Corticosteroids (ICS) are the only medications that are recommended for de-escalation in COPD, and de-escalation of ICS therapy should be considered if there is a lack of clinical benefit and/or side effects occur. Possible long-term effects of ICS include oral candidiasis, pneumonia, and, at higher doses, diabetes-related outcomes or bone fractures. The goal of this study will be to examine the percentage of patients with a diagnosis of COPD who are able to achieve full or partial ICS de-escalation after pharmacist intervention. Thirty-day and ninety-day hospital admission rates will also be assessed in patients who reduced or eliminated an ICS.

Methods: The patients included in this study have been diagnosed with COPD and are currently eligible for ICS de-escalation per the VA COPD dashboard. The patient must have an ICS component in their current COPD regimen. Patient charts will be reviewed from November 2021 to May 2022 and data collected will include age, sex, race, VA location, number of COPD admissions/ED visits in previous 12 months, number of COPD admissions/ED visits during VA 3 month study period, number of visits with the clinical pharmacist during 3 month trial, COPD assessment tool score prior to discontinuation or reduction of ICS and at 30 days, 60 days and 90 days, as available, and ICS medication name, dose, and de-escalation regimen.

Results: 25 out of 27 patients eligible for ICS de-escalation were able to successfully reduce or eliminate ICS from their regimen (93%). 19 patients were able to fully eliminate ICS from their regimen and 6 patients were able to partially reduce their ICS regimen. 2 patients were unsuccessful, one patient experienced worsening breathing and the other’s PCP requested that the patient remain on ICS after de-escalation was initiated. No patients reported or were found to require hospitalization, due to a COPD exacerbation during the study period.
**Conclusions:** Based on our results, most patients can likely be de-escalated without substantial worsening of breathing symptoms which can lead to a reduced medication burden and lower risk of side effects.
The Physician Approval Rates of Alternative Medication Therapy Management from Criteria Based Consultation Reviews Before and After the Implementation of the Physician Champions Program

**Objectives:** This study aims to determine if monthly meetings with chief and attending physicians to discuss appropriate use of medications for endocrinology disease states will help to improve the utilization of preferred alternative medications with criteria-based consultation (CBC) as compared to consultation alone.

**Methods:** This is an observational and retrospective cohort study including patient chart reviews. CBC reviews were observed before and after the implementations of a physician champions program. The primary outcome analyzed the physician acceptance rate of alternative medications. Secondary outcomes included market share data and time to completion of the review.

**Results:** There was a total of 428 CBC reviews collected. The physician acceptance rate for alternative medications before the physician champion program was 82.3% and after the start of the program the rate increased to 91.6% (p = 0.04). Cost percentage of the market share amongst the CBC medications reviewed increased from 3.71% in Quarter 1 to 3.91% in Quarter 4. Reviews completed within 72 hours was 76.9% in the intervention group and 76.5% in the controlled group.

**Conclusions:** The physician champions program has improved the acceptance rate of prescriber approved alternative medications. The program did not have a significant change in the market share or time to completion of reviews. Continuation of the study may be needed to see an improvement in cost and efficiency with CBC reviews.
Objectives: The optimal management of antithrombotic therapy in patients with atrial fibrillation (AF) undergoing a percutaneous coronary intervention (PCI) remains a challenge in clinical practice. Historically, these patients received a combination of an oral anticoagulant (OAC) and dual antiplatelet therapy (DAPT) with aspirin and a P2Y12 inhibitor following PCI. Several landmark trials evaluating this practice demonstrated an increased risk of bleeding with triple therapy compared to double therapy with a single antiplatelet agent and OAC. In 2019, BIDMC subsequently created a clinical practice guideline and implemented clinical surveillance tools and clinical decision support (CDS) in computerized provider order entry (CPOE) to assist with antithrombotic optimization and triple therapy reduction. The primary objective of this study is to evaluate the impact of CDS in reducing triple therapy in patients with AF undergoing a PCI. This study will assess the rate of prescriber adherence to CDS to optimize antithrombotic therapy.

Methods: A retrospective chart review of patients undergoing PCI with concomitant AF on anticoagulation was conducted to assess antithrombotic prescribing patterns following implementation of CDS between November 2019 and December 2021. Adult patients with AF on DAPT and any OAC combination following PCI were included in this chart review. Patients were excluded for other indications of DAPT or anticoagulation including coronary artery bypass graft, venous thromboembolism, left ventricular thrombus, mechanical heart valve, and peripheral vascular disease. Each patient was evaluated for provider adherence to CDS and guideline recommendations. Provider adherence was defined as a documented plan to define the triple therapy regimen duration and transition to double therapy by hospital discharge. Secondary outcomes included thrombotic, ischemic, or bleeding events within three months of PCI. Additionally, the total duration of triple therapy and combinations of antithrombotic agents were assessed.

Results: The rate of provider adherence to CDS and clinical guidelines will be reported and presented. Additionally, secondary outcomes will be documented as the rate of ischemic, thrombotic, and bleeding events within 3 months of PCI.
**Conclusions:** It is anticipated that this project will demonstrate the impact of CDS implementation on reducing triple antithrombotic therapy prescribing. Implementation of CDS and development of clinical practice guidelines may enhance medication safety practices, minimize adverse events and potentially improve patient outcomes.
Evaluation of antithrombotic prescribing patterns in patients with atrial fibrillation undergoing percutaneous coronary intervention following clinical decision support implementation

**Objectives:** The optimal management of antithrombotic therapy in patients with atrial fibrillation (AF) undergoing a percutaneous coronary intervention (PCI) remains a challenge in clinical practice. Historically, these patients received a combination of an oral anticoagulant (OAC) and dual antiplatelet therapy (DAPT) with aspirin and a P2Y12 inhibitor following PCI. Several landmark trials evaluating this practice demonstrated an increased risk of bleeding with triple therapy compared to double therapy with a single antiplatelet agent and OAC. In 2019, BIDMC subsequently created a clinical practice guideline and implemented clinical surveillance tools and clinical decision support (CDS) in computerized provider order entry (CPOE) to assist with antithrombotic optimization and triple therapy reduction. The primary objective of this study is to evaluate the impact of CDS in reducing triple therapy in patients with AF undergoing a PCI. This study will assess the rate of prescriber adherence to CDS to optimize antithrombotic therapy.

**Methods:** A retrospective chart review of patients undergoing PCI with concomitant AF on anticoagulation was conducted to assess antithrombotic prescribing patterns following implementation of CDS between November 2019 and December 2021. Adult patients with AF on DAPT and any OAC combination following PCI were included in this chart review. Patients were excluded for other indications of DAPT or anticoagulation including coronary artery bypass graft, venous thromboembolism, left ventricular thrombus, mechanical heart valve, and peripheral vascular disease. Each patient was evaluated for provider adherence to CDS and guideline recommendations. Provider adherence was defined as a documented plan to define the triple therapy regimen duration and transition to double therapy by hospital discharge. Secondary outcomes included thrombotic, ischemic, or bleeding events within three months of PCI. Additionally, the total duration of triple therapy and combinations of antithrombotic agents were assessed.

**Results:** The rate of provider adherence to CDS and clinical guidelines will be reported and presented. Additionally, secondary outcomes will be documented as the rate of ischemic, thrombotic, and bleeding events within 3 months of PCI.
**Conclusions:** It is anticipated that this project will demonstrate the impact of CDS implementation on reducing triple antithrombotic therapy prescribing. Implementation of CDS and development of clinical practice guidelines may enhance medication safety practices, minimize adverse events and potentially improve patient outcomes.
**Evaluation of adult H. pylori treatment success rates after changes to first-line antibiotic therapy dosing in Kaiser Permanente's electronic medical record H. pylori order set**

**Objectives:** Antibiotic resistance has decreased the effectiveness of standard regimens for the treatment of Helicobacter pylori (H. pylori). In July of 2021, to help improve treatment success for adults with H. pylori, Kaiser Permanente updated the first line antibiotic therapy in the adult H. pylori order panel to include higher initial doses of amoxicillin and metronidazole. This study aims to assess the efficacy of the dose changes on the successful eradication of the bacteria.

**Methods:** A retrospective chart review of adult patients with a first diagnosis of H. pylori will be conducted to compare treatment success rates before and after changes were made to the first-line antibiotic therapy dosing in the adult H. pylori order set in July 2021. The primary endpoint is the percentage of patients successfully treated for H. pylori, which will be analyzed using a chi-squared test. Secondary endpoints include percentage of patients who did not pick up their H. pylori medications and reported adverse events associated with the higher antibiotic dosing.

**Results:** Treatment success outcomes before and after the update to the adult H. pylori first-line antibiotic treatment order set in Kaiser Permanente's electronic medical record will be compared, and results will be presented.

**Conclusions:** It is anticipated that the current updated H. pylori first-line treatment regimen will be more efficacious in successfully treating H. pylori and improving patient clinical outcomes compared to the antibiotic regimens previously used.
Assessment of bleeding events with the therapeutic use of enoxaparin in cirrhotic patients compared to treatment dosing of unfractionated heparin in a large academic medical center

**Objectives:**
The concept of auto-anticoagulation in cirrhotic patients is controversial, hence the optimal anticoagulant in this population is unclear. The 2016 American College of Chest Physicians guidelines for antithrombotic therapy in venous thromboembolism (VTE) indicates low molecular weight heparin (LMWH) to be the preferred anticoagulant for therapeutic anticoagulation in liver disease, but does not further compare parenteral anticoagulants in this population. The purpose of this study is to assess the safety and efficacy of the use of therapeutic enoxaparin compared to unfractionated heparin (UFH) in the treatment of VTE in cirrhotic patients.

**Methods:**
This study will be a single center, retrospective review of adult patients admitted to UMMC with a diagnosis of cirrhosis or end stage liver disease and an index event of an acute deep vein thrombosis and/or pulmonary embolism on presentation or during their admission over a three-year period. The primary endpoint will evaluate bleeding events in cirrhotic patients on therapeutic enoxaparin compared to UFH in the 30 days following the start of anticoagulation using the Bleeding Academic Research Consortium (BARC) bleeding criteria. A secondary endpoint will assess the efficacy of anticoagulation in cirrhotic patients on therapeutic enoxaparin compared to UFH to determine the recurrence or progression of VTE in the 30 days that followed the start of anticoagulation.

**Results:**
Data collection is ongoing. Results are not available at this time and will not be presented.

**Conclusions:**
It is anticipated that the results of this study will describe practice patterns in the prescribing of anticoagulation at UMMC to support its safe and efficacious use in the cirrhotic population.
Application of a pharmacist designed clinical template to assist in pharmacogenomic (PGx) guided pharmacotherapy in a veteran population at VA Boston Healthcare System (VABHS)

Objectives: The Department of Veterans Affairs recently began an initiative to perform pharmacogenomic testing through the Pharmacogenomic Testing for Veterans (PHASER) program. Interpretation of PGx testing may be a vital service that allows healthcare providers to optimize medication therapy by minimizing drug toxicity and/or increasing effectiveness. Although there has been a sharp increase in the number of PGx tests ordered, it is hypothesized that medication changes that could be made through PGx-guided means are low.

Methods: This quality improvement study will include a retrospective chart review of VABHS patients who completed pharmacogenomic testing between 01/01/21 to 08/01/21. A template developed specific to PHASER panel genomic results will be utilized to determine what medications could be optimized through PGx-guided means based on the Clinical Pharmacogenetics Implementation Consortium (CPIC) guidelines. This template will then be compared to new medications that patients were prescribed after PGx results to determine number of potential PGx-guided interventions.

Results: The number of potential interventions that result from application of the template to the patient’s medication list will be recorded and results will be presented.

Conclusions: It is anticipated that findings from this study could provide baseline information regarding the number of PGx-guided interventions that may optimize patient outcomes as well as demonstrate a role for a pharmacogenomics pharmacist.
Authors: Amy Lee, PharmD; Matthew Ronan, MD; Jussi Saukkonen, MD; Lauren Finlay, PharmD

Title: Impact of implementation of a phenobarbital-based protocol for treatment of alcohol withdrawal in a veteran population

Objectives: The gold standard for treatment of alcohol withdrawal is symptom-triggered benzodiazepine therapy. While effective, patients may require frequent doses of benzodiazepines with an extended duration of hospitalization, which can increase risk of CNS depression, dependence, and delirium. In these patients, phenobarbital, a long-acting barbiturate, may be a promising alternative agent for treatment of alcohol withdrawal due to its effects on both increasing inhibitory GABA and reducing excitatory glutamate neurotransmission. The purpose of this study is to evaluate whether implementation of a phenobarbital-based protocol reduces mean hospital length of stay associated with alcohol withdrawal in a Veteran population.

Methods: This is a retrospective study including US Veterans admitted to VA Boston Healthcare System from March 1, 2018 to May 31, 2021 for alcohol withdrawal treated at least once on separate occasions with benzodiazepines or phenobarbital based on our institution's protocol. Chart review will be conducted utilizing the electronic medical record to obtain the following: age, gender, diagnosis, admission and discharge date, level of care, relevant past medical history, and total amount of phenobarbital or benzodiazepines required during admission. The primary outcome of interest is the difference in hospital length of stay in patients with repeated admissions for alcohol withdrawal treated with phenobarbital compared to benzodiazepines. The secondary outcomes include safety and drug administration measures, such as time to first dose administered of phenobarbital or benzodiazepine, need for escalation to ICU level of care, and adverse events.

Results: The difference in outcome measures, such as hospital length of stay, and safety in patients with repeated admissions for alcohol withdrawal when treated with phenobarbital based on our institution's protocol compared to prior treatment with symptom-triggered benzodiazepines will be recorded and results will be presented.

Conclusions: It is anticipated that this project may help evaluate efficacy and safety of the phenobarbital-based protocol for alcohol withdrawal syndrome.
Conference Abstracts  
May 16-18, 2022

Presenter Name: Liang, Connie  
Organization: James J. Peters VA Medical Center  
Category: Disease State Management/Outcomes  
Day | Session | Room | Time: Tuesday | 3 | Empire B | 12:30:00 PM

Authors: Connie Liang, PharmD; Marina Robertson, PharmD, BCPS; Troy Kish, PharmD, BCPS

Title: Evaluation of epoetin dose titrations and laboratory monitoring for patients with anemia on hemodialysis

Objectives: Erythropoiesis-stimulating agents like epoetin alfa are a mainstay treatment for patients with anemia on hemodialysis; however, their use is associated with a greater risk for death, cardiovascular events, and stroke which warrants careful monitoring. Due to the high cost and risks associated with these agents, the James J. Peters VA Medical Center (JJPVAMC) created a protocol to promote the safe and efficacious use of epoetin alfa. The purpose of this medication use evaluation is to assess the adherence of providers to the dosing and monitoring recommendations outlined by the protocol and to determine if patients are being appropriately repleted for iron.

Methods: A retrospective chart review will be conducted of the computerized patient record system to assess the percentage titration in weekly epoetin alfa dose and the frequency of hemoglobin monitoring in patients with anemia on hemodialysis. The study will include patients 18 years and older with anemia on hemodialysis, who were on epoetin from February 1st, 2021 to February 1st, 2022. Patients are excluded if they have a past medical history of hematologic disease (hematologic malignancies, pure red cell aplasia), had vitamin B12 or folate deficiency, are on peritoneal dialysis, or are deceased. Descriptive statistics will be used to analyze the data. The epoetin titrations will be recorded as percentage change from the previous weekly dose and the appropriateness of the titrations and monitoring according to the protocol were recorded as “yes” or “no.” If the patients’ hemoglobin was greater than 11.1 g/dL, it will be determined if the patients’ epoetin dose was held and restarted appropriately. If the monthly labs reflected transferrin saturation less than 30% and ferritin less than 800 mcg/L, then the medication history will be assessed for appropriate repletion of iron.

Results: The data is currently being collected. Results from this medication use evaluation will be presented.

Conclusions: This medication use evaluation will determine if providers are adhering to the JJPVAMC protocol. The results from this medication use evaluation will be analyzed and presented.
Title: Improving naloxone prescribing rate for patients receiving 50 morphine milligram equivalent per day or more of opioids.

Objectives:

Use of prescription opioids in higher doses can lead to dependence and increase the risk of opioid addiction, overdose, and death. It is important for patients and providers to discuss the risks of opioids, consider alternative therapies, and, if appropriate, prescribe opioids for fewer days and at lower doses. The 2016 CDC Guidelines for prescribing opioids for chronic pain recommends that providers prescribe naloxone together with higher opioid dosages to improve prescribing practices and to ensure patients receive safer, more effective pain treatment. The Opioid stewardship committee at BronxCare aims to reduce the overall number of patients on opioids and to provide some level of safety to the patients that are unable to eliminate or reduce opioid use. The objective of this study was to assess providers' adherence to the CDC recommendations on naloxone prescribing to patients receiving 50 morphine milligram equivalents (MME per day) or more of opioids. We will evaluate the rate at which BronxCare Health System providers prescribe naloxone to patients who are taking 50 MME per day or more of opioids, and to determine if education will improve the rate of provider prescriptions.

Methods:

This is a Performance Improvement Project to retrospectively review charts of patients who were discharged from BronxCare Health System between January 2021 and March 2022 on more than 50 MME per day of opioids. The inclusion criteria were adult patients who presented to BronxCare Health System over the study period. Data was collected using Electronic Health Records; all information was documented in a password-protected spreadsheet. The data collected was used as baseline from which improvements could be made. Prescribers were educated using various platforms including at P&T committee meetings, Prescriber Case Conferences and through emails on the benefits of prescribing naloxone to patients receiving high opioid doses. Post-education review of patients from January to March 2022 will be used to assess improvement in the naloxone prescription rate. Nominal data will be analyzed by Chi-Squared test. Significance will be set at a P value < 0.05.

Results:

The first (January to March) and last quarter (October to December) of 2021 pre-education data showed naloxone prescription rates of about 19% and 38%, respectively. Post
education review of data for the first quarter (January to March) of 2022 will be used to gauge improvement in prescription rate. This data collection and review are still pending.

**Conclusions:** It is hoped that this Performance Improvement Project will help increase the rate of naloxone prescribing in BronxCare Health System and reduce the overall incidence of opioid addiction and overdose.
**Presenter Name:** Papi, Paul  
**Organization:** Wilkes-Barre VA Medical Center  
**Category:** Disease State Management/Outcomes  
**Day | Session | Room | Time:** Monday | 2 | Empire B | 3:00:00 PM

**Authors:** P. Papi, K. Hang; N. Snyder  

**Title:** Impact of continuous glucose monitoring systems on diabetes outcomes in pharmacist-led clinics

**Objectives:** Most patients with diabetes rely on self-monitoring of blood glucose for assessment of glycemic control. This method allows patients and providers to assess the direct impact of diet, exercise, and medications on blood glucose levels. Drawbacks of this method include dexterity, the need to perform a fingerstick, and potential scarring of finger tissue. Continuous Glucose Monitoring Systems differ in that they do not use fingerstick testing to assess current glucose level. The objective of this research is to measure the effectiveness on clinical outcomes in diabetic patients that switched from self-monitoring to FreeStyle Libre systems and to assess the accuracy of these systems in patients treated in pharmacist-led clinics.

**Methods:** This retrospective chart review will analyze medical records of patients with diabetes on FreeStyle Libre (14-day and Libre 2) monitoring systems in pharmacist-led clinics at the Wilkes Barre VAMC, from December 2018-October 2021. Hemoglobin A1c (HbA1c) and patient specific HbA1c goal will be collected at baseline (prior to the initiation of FreeStyle Libre system). HbA1c will also be collected at 3-month, 6-month, and most-recent (if applicable) visits. The following secondary endpoints will also be collected: the average number of FreeStyle scans per day, the number of times patients use self-monitoring method per day (prior to and after FreeStyle Libre usage), patients with documented false glucose readings, documented hypoglycemic events, number of patients who reached their patient specific HbA1c goal, number of patients that needed to double-check with self-monitoring meter, and use of substances known to falsely alter FreeStyle readings.

**Results:** The change in HbA1c, number of patients who reached their patient specific HbA1c goal, and documented false glucose readings will be recorded and results will be presented. It is expected that results will be similar to previous studies, which have shown that patients on long-acting insulin that switched from self-monitoring to FreeStyle Libre systems had a 0.6% HbA1c reduction after 6 months and 0.5% reduction after one year. FreeStyle Libre systems also have documented inaccuracies, particularly when blood glucose levels are low. Studies have shown when interstitial glucose levels are below 60mg/dL, there is a 40% chance that repeat blood glucose levels with self-monitoring are within 81-160mg/dL.
Conclusions: It is anticipated that this project will increase understanding on the impact that continuous glucose monitoring can have on diabetes outcomes within pharmacist-led clinics in the VAMC system. This project may also help anticipate the possibility for false glucose readings and assess patient satisfaction of FreeStyle Libre systems.
**Title:** Assessment of the impact of clinical interventions made by pharmacists on hospital length of stay

**Objectives:** Hospital length of stay (LOS) is an important measure in patient outcomes. Studies have shown that a prolonged length of stay in the hospital is associated with increased inpatient complications such as hospital acquired infections and falls. Studies have also shown clinical pharmacist interventions to reduce average hospital length of stay. The purpose of this study is to assess the impact of clinical interventions made by pharmacists on hospital length of stay.

**Methods:** This is a single center, pre- and post-interventional study that will assess the impact of pharmacist clinical interventions on patient LOS. The clinical interventions include intravenous (IV) to oral (PO) conversions, antimicrobial de-escalation interventions, pharmacokinetics interventions, anticoagulation monitoring and medication de-prescribing interventions. Clinical interventions made by pharmacists were evaluated monthly using a report created in Epic. Patients greater than or equal to 18 years of age, admitted to medical/surgical floors, had an LOS > 1 day and who were at high risk for prolonged LOS were included in this study. The study population excluded mortality and patients who were in hospice or palliative care or transferred to the intensive care unit (ICU) during hospital stay. The primary outcome is hospital length of stay. Secondary outcome measures include total number of pharmacist interventions and interventions including IV to PO medication conversion, antimicrobial de-escalation, pharmacokinetics, anticoagulation monitoring and medication de-prescribing.

**Results:** The relationship between the number of clinical interventions made by pharmacists and hospital length of stay will be evaluated and presented.

**Conclusions:** It is anticipated that this study will demonstrate a role for pharmacist clinical interventions to decrease the length of stay for hospital patients.
Incidence of hyperglycemia after antipsychotic use for management of acute agitation in the emergency department

Objectives: The primary outcome of the study was the number of hyperglycemia glycemic episodes in patients who received at least one dose of antipsychotic agent (defined as the number of events that blood glucose on basic metabolic panel was > 180 mg/dL).

Methods: From June 1, 2018 to May 31, 2021, medical records from 1,163 patients admitted to General or Memorial emergency department within Charleston Area Medical Center were screened for eligibility. Antipsychotic agents analyzed within the study were haloperidol, fluphenazine, olanzapine, risperidone, and ziprasidone. Patients were included if ≥18 years old, received at least one dose of IV/IM antipsychotic in the emergency room, baseline blood glucose < 18 years old, pregnant, receiving antipsychotics prior to admission, continued on scheduled antipsychotics, initial blood glucose > 180 mg/dL, without repeat blood glucose within 24 hours, or were receiving an antipsychotic agent different than initially administered. Descriptive statistics, such as means and standard deviations for continuous variables and proportions and frequencies for categorical variables, were used. Comparisons of categorical variables will be performed using Chi-square to determine statistically significant differences. Continuous variables will be compared by using the analysis of variance, Anova.

Results: Of the patients screened, 33 met criteria, with 15 patients receiving haloperidol and 18 patients receiving olanzapine during their admission. There was no statistical significant difference in incidence of hyperglycemia post antipsychotic (30 patients with no hyperglycemia vs 3 patients with hyperglycemia, p = 0.7497). No patients with diabetes had an incidence of hyperglycemia post antipsychotic, and 1 patient with a BMI ≥ (8.33%) had incidence of hyperglycemia post antipsychotic.

Conclusions: Based on the results of this study, patients treated with at least one dose of an antipsychotic agent in the emergency department had no statistically significant difference in hyperglycemia within 24 hours of antipsychotic administration.
Evaluation of Pharmacist Co-Management of Gender Affirming Hormone Therapy in an Endocrinology Clinic (Access-GAHT)

### Objectives
This will be an exploratory quality improvement initiative to evaluate the benefit of adding a pharmacist to a multidisciplinary team managing gender hormone affirming therapy.

### Methods
Pharmacotherapy evaluations by a pharmacist will be conducted for all patients age 16 years or older who identify as transgender, gender-nonconforming, or gender non-binary receiving medications for gender affirming care at an endocrinology clinic. Opportunities for the pharmacist to optimize medication regimens, adherence, and access will be evaluated for their ability to bring patients to target hormone levels and gender affirming goals. The benefit of pharmacist co-management of gender affirming care will be evaluated through the percent of patients achieving hormone goals, recommendation acceptance rate by the endocrinologist, types of interventions made, and incidence of side effects and serious side effects.

### Results
The acceptance rate, intervention types, and safety data will be recorded and presented.

### Conclusions
It is anticipated that this project will demonstrate a benefit of pharmacist co-management of gender hormone affirming therapy to both the endocrinologist and to the patients.
Presenter Name: Uwechia, Uzoamaka  
Organization: Montefiore Medical Center  
Category: Disease State Management/Outcomes  
Day | Session | Room | Time: Tuesday | 3 | Empire B | 12:15:00 PM

Authors: U. Uwechia, P. Goriacko; Montefiore Medical Center, Bronx, New York

Title: Effects of real-world use of interleukin-6 receptor inhibitors on outcomes in non-critically ill COVID-19 patients

Objectives: Interleukin-6 receptor inhibitors have been used for the treatment of rheumatoid arthritis and are now employed for the treatment of severe COVID pneumonia, specifically to stop a cytokine storm which can result in multiorgan failure and death. The purpose of this study is to explore the benefits of interleukin-6 receptor inhibitors on preventing the progression of severe COVID-19 patients to the ICU in a real-life setting.

Methods: Montefiore Medical Center patients with COVID pneumonia that required high-flow nasal cannula on admission from July 15th, 2020 to July 15th, 2021 were reviewed. Those that required ICU admission within 24 hours of COVID-19 treatment administration were excluded. A chi-square test was used to compare the number of patients that required an ICU admission after being given standard of care or standard of care including an interleukin-6 receptor inhibitor.

Results: The difference in number of patients that progressed to needing ICU level care will be recorded and results will be presented.

Conclusions: It is the hope that the information gained from this study will give insight on the value of IL-6 inhibitors and influence guidelines for severe COVID-19 treatment.
Impact of CGM on A1c in Patients ≥ 65 Years of Age with Type 2 Diabetes Mellitus

**Objectives:** Continuous glucose monitoring is currently recommended in patients with type 2 diabetes on intensive insulin regimens and those at risk for hypoglycemia. Benefits of continuous monitoring compared to traditional fingerstick monitoring without regard to insulin regimen or other antidiabetic agents in the elderly population will provide novel information. This study aims to identify if a greater percentage of patients 65 years of age or older with type 2 diabetes mellitus who use continuous glucose monitoring achieve an A1c of ≤ 8% with fewer hypoglycemic events compared to traditional fingerstick blood glucose monitoring.

**Methods:** This retrospective cohort was conducted using electronic health record data and Geisinger Health Plan claims from 7/27/2018 - 8/31/2021 to identify patients 65 years or older with type 2 diabetes who have received a continuous glucose monitor or testing supplies through Geisinger insurance with a baseline A1c of 9% or greater. Emergency department records were also used to assess incidence of level 3 hypoglycemia. The study excluded patients without a baseline A1c, with fewer than two A1c measurements, and those taking ascorbic acid or hydroxychloroquine. Patients were also excluded if monitoring blood glucose for less than three months or an A1c was not obtained 3-12 months into continuous glucose or fingerstick monitoring. Chi squared analysis was used for the primary outcome of percentage of patients with an A1c of ≤ 8%, independent t-test was used to analyze the secondary outcome of average A1c lowering in each group, and Fisher's Exact Test was used for the secondary outcome of occurrence of level 3 hypoglycemia.

**Results:** Final data analyses were conducted on a total of 496 patients (248 in each group). Patients using continuous glucose monitoring were more likely to meet the primary outcome of achieving an A1c of ≤ 8% [X2 (1, N = 496) = 10.13, p = .001]. The traditional fingerstick monitoring group had a greater average percentage lowering of A1c (-2.05%) compared to the continuous glucose monitoring group (-1.84%) which was not statistically significant (p=.3). Lastly, hypoglycemic events occurred in 2 patients, both in the continuous glucose monitoring group which provides inconclusive results for the outcome of occurrence of hypoglycemic events (p=0.50).
**Conclusions:** Patients 65 years of age and older with type 2 diabetes mellitus on basal insulin alone, or multiple daily insulin injections are more likely to achieve an A1c of ≤ 8% while using continuous glucose monitoring compared to traditional fingerstick monitoring.
Authors: Reemal Zaheer, PharmD; Roma Amin, PharmD, BCACP; LaTasha Riddick, PharmD, BCACP; Sujin Wolff, PharmD; Amy Nathanson, PharmD, BCACP; Scott Newsome, DO, MSCS, FAAN, FANA

Title: Impact of COVID-19 on treatment selection for multiple sclerosis

Objectives: Certain classes of multiple sclerosis (MS) disease modifying therapies (DMTs) have been associated with an increased risk of severe COVID-19 resulting in prescribers considering changes in their practice habits during the COVID-19 pandemic. This study will identify if differences exist in prescribing patterns of DMTs and analyze and assess the reason for modification of therapy during 3 timeframes.

Methods: A retrospective review of medical records at Johns Hopkins Health System (JHHS) was performed. The timeframe of the study, April 2019 to December 2021, was divided into three subcategories: pre-pandemic (April 2019–March 2020), pre-vaccine pandemic (April 2020–March 2021), and post-vaccine pandemic (April 2021–December 2021). Patients were identified through dispense reports from pharmacy dispensing system, and prescribing report from the health-system electronic health record (EHR). Health-system EHR was also utilized to conduct chart reviews for a subset of patients that had a modification in their therapy during the specified timeframes. The study included adult patients that were prescribed at least one DMT through the Johns Hopkins (JH) Pharmacy Services during the study timeframe and those who stayed on their DMT for at least 2 months without any tolerability issues. Descriptive statistics was used to compare the prescribing practices during the timeframes with the percentage of prescribing for each type of treatment and to assess the percentage of patients that switched therapies in the different time periods.

Results: Based on prescribing data, 670 patients were prescribed a DMT during the pre-pandemic period with infusion therapies being the most prescribed therapies during this timeframe (38%), followed by oral therapies at 35%. In comparison, a total of 620 patients were prescribed a DMT during pre-vaccine pandemic and the percentage of prescriptions of infusion therapies decreased to 28% (-10%) during this timeframe, whereas oral prescriptions increased to 42% (+7%). These trends continued during the post-vaccine timeframe where infusion therapies decreased to 26% (-12%) and oral therapies increased to 43% (+8%) in reference to the pre-pandemic period. Prescribing patterns of self-injectable therapies remained stable throughout the 3 timeframes. 500 patients were randomly selected for chart reviews to assess
therapy modifications due to COVID-19. No therapy changes due to COVID-19 were observed during pre-pandemic period. The percentage of therapy change due to COVID-19 increased to 45.2% during pre-vaccine period and remained at 38.4% during post-vaccine period. Majority of the changes due to COVID-19 were delays in therapies, not medication changes.

**Conclusions:** Prescribing patterns and therapy modifications of DMTs for MS patients were impacted by COVID-19, with the greatest changes observed for the infusion therapies, including reduction in percentage of infusion prescriptions and delays in infusion therapies. Prescribing patterns of lower efficacy self-injectable therapies (interferon-beta and glatiramer acetate) remained stable. The outcomes of this study will provide background for future outcomes-focused research studies for MS patients.
Conference Abstracts  
May 16-18, 2022

Presenter Name: Zia, Nauman  
Organization: Peconic Bay Medical Center  
Category: Disease State Management/Outcomes  
Day | Session | Room | Time: Wednesday | 5 | Empire B | 1:30:00 PM

Authors: N.Zia; Peconic Bay Medical Center (PBMC), Riverhead, New York

Title: Pilot program of pharmacy-directed COPD inhaler optimization and discharge education

Objectives: Chronic Obstructive Pulmonary Disease (COPD) has an estimated worldwide prevalence of 4%-10% and is the third leading cause of morbidity and mortality worldwide. COPD rehospitalizations are frequent, with Medicare beneficiaries having a 20% return within 30 days of discharge. This study aims to determine if pharmacist-directed COPD inhaler education and optimization will result in reduced 30-day hospital readmission rates for patients with COPD. Furthermore, it will evaluate patients' adherence based on their ability to retain inhaler education information.

Methods: A prospective, single center study was completed for two months and results were compared to a retrospective three month chart review. Patients meeting inclusion criteria will be followed for 30 days to assess for readmission rates. During prospective intervention period, patients' medications were optimized and discharge inhaler education was provided. Adherence was assessed at baseline and again with phone follow-up calls two-five days post discharge with re-education provided, when needed.

Results: The number and percentage of pharmacist-recommended medication optimizations, patients' baseline and follow-up adherence scores, and 30-day readmission rates for patients hospitalized with COPD in both prospective and retrospective groups will be recorded and results will be presented.

Conclusions: It is anticipated that this project will demonstrate a role for pharmacist-led COPD optimization and inhaler education in order to increase patient inhaler adherence and reduce 30-day readmission rates.
Conference Abstracts
May 16-18, 2022

Presenter Name: Dai, Hanyu
Organization: Baystate Medical Center
Category: Drug and Poison Information
Day | Session | Room | Time: Monday | 1 | Wild Rose A | 12:45:00 PM

Authors: H. Dai, M Klee, E Horton; Baystate Medical Center. Springfield, MA

Title: Increasing naloxone access for inpatients at high risk of opioid overdose

Objectives: According to the CDC, the 2021 rate of opioid-related overdose deaths (76,000) increased over 40% compared to 2020 and is 600% higher than 1999. The opioid epidemic remains a widespread public health emergency, contributing to increased emergency department visits, infectious disease outbreaks, and heavy economic burden from preventable health costs and lost productivity. Harm reduction efforts to increase access to overdose reversal agents are critical to combat this epidemic. The objective of this pharmacist-driven, single-service, pilot project was to increase naloxone prescribing for inpatients at high risk of opioid overdose. Ultimately, this project aims to develop a hospital-wide pharmacist-driven inpatient naloxone prescribing protocol to increase naloxone prescribing for identified high risk inpatients.

Methods: The Baystate Medical Center (BMC) pharmacy department coordinated with the Addiction Consult service to identify patients at high risk for opioid overdose utilizing the Addiction Consult Service proxy list, which consists of all hospitalized patients with addiction consults placed by their primary care teams. Pharmacist-driven intervention was provided for identified patients which included naloxone recommendations to patients’ primary care team providers via in-house messaging system. Electronic delivery of naloxone prescriptions to the BMC outpatient pharmacy was encouraged for ease of data collection and analysis. The preintervention and postintervention periods were two-months each in length. Naloxone prescribing and patient pick-up rates were compared before and after implementation of pharmacist-driven intervention. The primary outcome was the percent change in the number of naloxone prescriptions prescribed for identified patients at high-risk for opioid overdose and had an addiction consult.

Results: A total of 125 patients were reviewed during the preintervention period, and 86 patients (68.8%) were eligible for pharmacist-driven intervention. A total of 14 prescriptions were sent to BMC outpatient pharmacy with a naloxone prescribing rate of 16.27%. Preliminarily, of the 84 patients that were reviewed during the postintervention period, 39 (46.4%) were eligible for pharmacist-driven intervention and 16 (41.01%) prescriptions were sent. The percent change in naloxone prescribing rate for identified patients was 24.74%. Thirteen of 16 (81.25%) were pharmacist driven.
Conclusions: The increase in naloxone prescribing rate shown by the implementation of pharmacist-driven intervention highlights the value of pharmacists' involvement in increasing access to naloxone for high-risk patients. Our results are from only one institution over a short period of time, and therefore results may be underestimated due to myriad of reasons, including prescriptions being sent to outside pharmacies at the patient's request.
Elashal, Basem

Evaluation of telephonic versus in-person medication counseling on patient satisfaction

Conference Abstracts
May 16-18, 2022

Presenter Name: Elashal, Basem
Organization: Hunterdon Medical Center, Flemington, New Jersey
Category: Education
Day | Session | Room | Time: Monday | 2 | Empire C | 3:15:00 PM

Authors: B. Elashal, A. Philips, R. Madduri, M. Varghese, S. Durrani

Title: Evaluation of telephonic versus in-person medication counseling on patient satisfaction

Objectives: Since the outbreak of SARS-Cov-2 in the fall of 2019, healthcare systems and networks across the United States have expanded telehealth services. Telehealth services aim to deliver high quality care, patient satisfaction and counseling through remote, two-way communication. However, it is unclear whether or not telehealth garners as much patient satisfaction or is as effective as in-person care. Evidence of inpatient telehealth services is limited in both quantity and in scope, as most inpatient counseling pertains to medication-reconciliation or discharge-counseling. Comparing the effectiveness and preference of telephonic counseling against in-person counseling will allow for drawn correlations to patient satisfaction.

Methods: Patients admitted to the inpatient floors at Hunterdon Medical Center and identified through the hospital's electronic health record routinely receive medication counseling on newly initiated medications. Enrollment for this study was conducted from February 11, 2022 to March 18, 2022, during which patients from a care facility or lacking cognitive abilities were excluded. From the list of new admissions, patients were randomized to receive telephonic or in-person counseling. The patients must have been counseled by that method within 3 attempts. The day following receipt of medication counseling, patients were surveyed regarding the quality of the counseling and their preference for either telephonic or in-person counseling, both being the composite primary outcome. Additional information collected to serve as the secondary outcomes include: time spent preparing to counsel and conducting counseling, proportion of patients counseled per method, information specific to counseling patients.

Results: The average survey responses, average time spent preparing to counsel and to conduct counseling, and the number of patients counseled per method will be recorded and presented.

Conclusions: The anticipated results of this research will demonstrate the in-patient utility of tele-counseling and the advantages each counseling method has to ensure inpatient education and satisfaction.
**Conference Abstracts**  
May 16-18, 2022

**Presenter Name:** Hassey, Avery  
**Organization:** Jefferson Abington Hospital  
**Category:** Education  
**Day | Session | Room | Time:** Monday | 2 | Empire C | 3:45:00 PM

**Authors:** Avery Hassey, PharmD; Rachel Trichtinger, PharmD, BCCP  
**Title:** Acceptance of Nicotine Replacement Therapy for Patients on an Inpatient Psychiatric Unit after Pharmacist Adherence Counseling

**Objectives:** The purpose of this study was to evaluate the impacts of pharmacist-led counseling on the benefits of NRT, when a pharmacist intervenes within 72 hours of a patient declining NRT.

**Methods:** This study was completed in the behavioral health unit of a single institution. Acceptance rates of NRT were compared before and after implementing an educational program, which was expected to increase adherence. Patients who were identified as heavy smokers (>5 cigarettes per day or >1 cigar per day) and declined initial NRT were observed to see if an additional layer of counseling improved their willingness to accept NRT. In patients who declined initial NRT, motivational interviewing on the benefits of nicotine replacement and smoking cessation was completed within 72 hours. Tracking was maintained to identify the number of patients counseled by a pharmacist and to identify patients who accepted or denied NRT after counseling. The primary outcome was the percentage of patients, who throughout their admission, accepted NRT at least once. Secondary outcomes included adherence to NRT during their hospitalization (adherence defined as >80% compliance) and the acceptance of referrals to outpatient smoking cessation. All data was assessed to observe the impact of pharmacist-led counseling, hypothesizing an increase in endpoints.

**Results:** Overall, 46 patients were included in the study. The primary outcome, using NRT at least one-time during hospitalization, was greater in the retrospective arm versus the prospective arm, however, the difference was not statistically significant (82% vs. 75%; p=0.58). Both secondary endpoints, adherence during hospitalization and acceptance to outpatient smoking cessation referrals, were greater in the retrospective arm, however, the differences were not statistically significant between groups [(adherence: retrospective vs. prospective; 64% vs 63%; p=0.57) (acceptance to outpatient referral: retrospective vs. prospective; 91% vs 67%; p=0.09)].

**Conclusions:** The acceptance rates for NRT did not increase in patients who initially denied NRT, even after additional education was provided by a pharmacist.
Author Name: Leigh Mathieu, PharmD, Phillip Gall, PharmD, Kathleen Coffin, PharmD, BCGP

Title: Impact of a Multi-Disciplinary Virtual Heart Failure Clinic on Veterans with Heart Failure with Reduced Ejection Fraction

Objectives: The purpose of this study is to assess the effect of a virtual clinic on CHF admissions in Veterans with HFrEF. We also evaluated acute kidney injury (AKI) admissions as a safety outcome in the setting of aggressive diuresis and use of nephrotoxic medications.

Methods: This study is a one-year retrospective chart review of male and female Veterans with HFrEF from 08/2020 to 08/2021. The intervention group includes HFrEF patients referred to the CHF clinic for medication titration and monitoring. An equal number of controls were randomly selected from the VA National Academic Detailing Service's Heart Failure Patient Report. Veterans with heart failure with preserved ejection fraction (HFpEF), American College of Cardiology/American Heart Association (ACC/AHA) Stage D heart failure, a planned procedure, or on hospice care were excluded from the study. A retrospective chart review was conducted on 62 Veterans to collect information on CHF and AKI admissions, whether GDMT medications were used, and the number of hospitalized days. Research personnel used Microsoft Excel to perform descriptive statistics on outcome measures and baseline characteristics. In the primary endpoint, admission rates were determined by evaluating the number of overall and per person CHF or AKI admissions for each group. T-tests and chi-squared tests will be used to assess statistical significance between the intervention and control groups.

Results: Heart failure and acute kidney injury admission rates will be recorded and presented.

Conclusions: We anticipate that the virtual heart failure clinic will reduce heart failure admissions and optimize guideline directed medical therapy utilization.
Impact of pharmacist driven interventions on benzodiazepine use in at risk veteran populations

Objectives: Inappropriate benzodiazepine use poses significant health risks to certain Veteran populations including those 65 years of age and over and those with a PTSD diagnosis. Compared to national VA averages, the VA Maine Healthcare System has higher percentages of Veterans 65 years and older and/or with PTSD with active benzodiazepine prescriptions. Pharmacy driven intervention has been shown to decrease rates of inappropriate medication use. The purpose of this study is to assess the impact of pharmacist driven interventions on benzodiazepine use in Veteran populations with active benzodiazepine orders who are ages 65 and older and/or have a diagnosis of PTSD.

Methods: This one-year, prospective study will take place from September 2021 to July 2022. All Veterans who have active benzodiazepine prescriptions and are 65 years of age or older and/or have a diagnosis of PTSD are eligible for inclusion. Subjects will be identified through the VA Psychiatric Drug Safety Initiative (PDSI) management system. Veterans will be contacted via phone for initial education regarding risks of benzodiazepine use and to determine appropriate intervention or follow-up. Primary outcomes include rate of Veterans who accept referral, percentage of Veterans who either discontinue, reduce dose, or have no change in benzodiazepine therapy over a six month follow up period. Secondary outcomes include assessment of perceived therapeutic effectiveness of benzodiazepine therapy at baseline and following intervention using a numerical rating scale, level of interest in decreasing or discontinuing benzodiazepine dose, percentage of intervention type (education, chart consult, direct assistance in taper schedule), follow up on tolerability, efficacy and medication adjustment, percentage of addition of naloxone where appropriate, and level of intervention patient satisfaction.

Results: The percentage of patients who had a decrease in dose or discontinuation of benzodiazepines, as well as results regarding secondary outcomes such as type of intervention and Veteran satisfaction with intervention will be presented.

Conclusions: It is anticipated that this project will demonstrate how pharmacist based intervention plays a role in reducing benzodiazepine use in at risk Veteran populations.
Title: Real world outcomes of biosimilar conversions at VA Maine Healthcare System

Objectives: Biologics compose a diverse category of products including therapeutic proteins, monoclonal antibodies, and vaccines. Over the last decade, biosimilar medications have been developed as more affordable treatment alternatives to their reference biologic product. Concerns, however, have been raised that switching patients from biosimilar to biosimilar may result in safety complications or even a loss of efficacy; additionally, the data for cross-switching of biosimilars is not robust. Therefore, the objective of this research project is to assess the outcome of switching between infliximab products-Remicade, Inflectra, and Renflexis-amongst Veterans Affairs (VA) Maine Healthcare Veterans to ensure switches have been safe and effective.

Methods: Veterans who received Remicade, Inflectra, or Renflexis over a four-year period were identified through standard query language using Veterans Information Systems and Technology Architecture. From that report, a data set of Veterans who received at least two of the infliximab products were selected. Subsequent chart review of each Veteran was conducted with the VA electronic health record system and the following information was collected: age, sex, diagnosis, name of tumor necrosis factor-inhibitor (TNF-I) medication, dose of TNF-I, presence of dose increase of TNF-I, start date of TNF-I, end date of TNF-I, date of dose increase, number of days on treatment, success at 6-months, date of TNF-I treatment failure, presence of adverse effect, date of adverse effect, and type of adverse effect. Each patient's chart was evaluated to determine treatment success at 6-months, which is defined by maintenance of biosimilar treatment. A secondary analysis will investigate the time to treatment failure after switching infliximab products; the time to adverse event after switching infliximab products; and the time to dose increase.

Results: The percentage of treatment success at 6-months, as well as secondary outcomes, will be recorded and presented.

Conclusions: It is anticipated that this project will demonstrate the outcome of switching between infliximab products-Remicade, Inflectra, and Renflexis-to ensure switches have been safe and effective.
Fixed versus weight-based dosing of 4-factor prothrombin complex concentrate for apixaban and rivaroxaban reversal

**Authors:** A. Banawan, D. Holden, E. Maceira

**Title:** Fixed versus weight-based dosing of 4-factor prothrombin complex concentrate for apixaban and rivaroxaban reversal

**Objectives:** Use of Factor Xa (FXa) inhibitors, apixaban and rivaroxaban, offer advantages over warfarin including reduction in bleeding risk. Despite this reduction, the annual rate of intracranial hemorrhage (ICH) is reported to be 0.3 – 0.6%. Off-label use of four-factor prothrombin complex concentrate (4-F PCC) for reversal is widespread and optimal dosing is still undefined. Institutional guidelines initially developed were weight-based, however, a shortage led to implementation of fixed dosing (<80 kg: 1000 units, ≥ 80kg: 2000 units). The purpose of the study is to compare use of fixed and weight-based dosing of 4-F PCC in patients receiving FXa inhibitors who present with an ICH.

**Methods:** This was a retrospective review of patients presenting with an intracranial hemorrhage who were administered 4-F PCC between January 2015 and February 2022 for reversal of apixaban or rivaroxaban. Patients were excluded if they had no follow-up CT scan after 4-F PCC administration, had a scalp hematoma not constituting an ICH, or had an epidural hemorrhage. Data collected included patient demographics, clinical, laboratory and radiology data. Radiographic impressions of the ICH were read before and after 4-F PCC administration to define efficacy. Effective hemostasis was defined as an unchanged or similar radiologic exam, and ineffective hemostasis was defined as significant interval increase in the ICH. The primary efficacy outcome was the rate of effective hemostasis in the fixed-dose compared to the weight-based dose group following 4-F PCC administration. The primary safety endpoint was rate of thromboembolic events up to 30 days after administration. Secondary efficacy outcomes were length of stay and disposition location. Statistical analysis for the primary efficacy and primary safety outcomes utilized the two-sided exact Fisher's test.

**Results:** One hundred and nine patients were reviewed who received reversal for apixaban or rivaroxaban. Sixty-six patients received fixed dosing and forty-three received weight-based dosing. Effective hemostasis was not statistically different between the fixed-dose and weight-based dosing, 53/66 (80%) and 37/43 (86%) respectively (p-value= 0.6065). There were 7 deep vein thrombosis (DVT) in the fixed dose group and 1 DVT discovered in the weight-based group with p-value of 0.1437. Overall, 74% in each group were discharged home or to a nursing facility.
Conclusions: Fixed doses of 4-F PCC and weight-based dosing provided similar rates of effective hemostasis.
Impact of a thrombolytic formulary conversion from alteplase to tenecteplase on management of acute ischemic stroke

**Objectives:** Systemic thrombolysis in patients with acute ischemic stroke has been shown to reduce mortality and disease-related disability. At the present time, alteplase is the only thrombolytic with an FDA-approved indication for management of acute ischemic stroke. Despite not having a labeled indication for treatment of stroke, tenecteplase is a thrombolytic agent with emerging evidence supporting similar efficacy data and potential safety and operational advantages as compared to alteplase. Its greater fibrin specificity and longer half-life permit dosing tenecteplase as a single bolus over 5 seconds as compared to a bolus followed by an hour-long infusion with alteplase. Based upon available clinical trial evidence and stroke guideline support, UPMC Central Pa Region converted its stroke thrombolytic of choice from alteplase to tenecteplase on January 19, 2021. The purpose of this study was to evaluate efficiency of thrombolytic administration, incidence of thrombolytic-related adverse drug events and acquisition cost of thrombolytic therapy following a change in practice to use of tenecteplase for acute ischemic stroke thrombolysis.

**Methods:** This study was conducted as a retrospective, 6-month pre-/post-analysis comparing ischemic stroke patients who received thrombolysis with alteplase from July through December of 2020 to patients who received thrombolysis with tenecteplase from February through July of 2021. The month of thrombolytic conversion â€“ January 2021 â€“ was intentionally censored from data collection. Eligible patients were reviewed to evaluate stroke-related treatment metrics and adverse drug events. Thrombolytic acquisition costs were calculated in 2021 dollars.

**Results:** A total of 111 alteplase-treated and 95 tenecteplase-treated acute ischemic stroke patients were identified during the 12-month period. Patients who received tenecteplase as compared to alteplase had thrombolytic therapy available more quickly (4 versus 9 minutes; p < .001), more rapid initiation of thrombolysis (11 versus 17 minutes; p < .001) and faster completion of thrombolytic administration (11 versus 78 minutes; p < .001). Incidence of post-thrombolysis symptomatic cerebral hemorrhage was similar for both agents (3.6% for alteplase versus 4.2% for tenecteplase; p = 1). Conversion from alteplase to tenecteplase was associated with an annualized reduction in medication costs of nearly $1 million.
Conclusions: The results of our evaluation support the utilization of tenecteplase over alteplase as the thrombolytic of choice for patients with acute ischemic stroke eligible for systemic thrombolysis.
Comparison of two different alcohol withdrawal protocols used within a healthcare system

**Objectives:** Hartford Healthcare implemented a new protocol using a fixed-dose benzodiazepine plus as-needed (PRN) benzodiazepine in replacement of a lorazepam drip plus PRN lorazepam. This change was implemented on December 1, 2020 at St. Vincent’s Medical Center, March 2, 2021 at Backus Hospital and Windham Hospital, April 6, 2021 at Hartford Hospital, and May 4, 2021 at Hospital of Central Connecticut, MidState Medical Center, and Charlotte Hungerford Hospital. The aim of this study is to investigate whether one protocol is more effective than the other at controlling alcohol withdrawal symptoms.

**Methods:** Medical records of 100 patients treated with the retired protocol (lorazepam drip plus PRN lorazepam) between January 1, 2019 and January 1, 2020 were assessed by retrospective chart review. Medical records of 50 patients treated with the new protocol (fixed-dose benzodiazepine plus PRN benzodiazepine) between the implementation date (as stated in the “Objectives” section) to six months from that date were also reviewed. Patients 18-89 years of age were included if they had an inpatient admission for alcohol withdrawal or a documented history of alcohol withdrawal, admitted for a reason other than alcohol withdrawal; reasons for exclusion were pregnancy, allergy or contraindication to any of the study medications, baseline cognitive or psychiatric impairment unrelated to alcohol withdrawal, or a history of sedative use for a reason other than alcohol withdrawal.

**Results:** The primary outcome is the time required to achieve and maintain a Clinical Institute Withdrawal Assessment for Alcohol, revised (CIWA-Ar) score <8 or modified Minnesota Detoxification Scale (mMINDS) score <15 for at least 24 hours, from the start of alcohol withdrawal treatment. Secondary outcomes include, but are not limited to: Total dose of benzodiazepines used (chlordiazepoxide, lorazepam, diazepam) Total dose of PRN benzodiazepines used (lorazepam or diazepam) Adjunctive medications administered (gabapentin, valproic acid, phenobarbital, or dexmedetomidine) Total dose of adjunctive medications administered (gabapentin, valproic acid, or phenobarbital) for alcohol withdrawal management Total duration of treatment for alcohol withdrawal, defined as the time between the first and last dose of benzodiazepines administered for alcohol withdrawal Hospital and ICU length of stay Over-sedation due to treatment for alcohol withdrawal (defined as
Richmond Agitation-Sedation Scale (RASS) score < -2

- Number of doses held due to oversedation
- Intubation requirement due to severe alcohol withdrawal
- Mortality

**Conclusions:** It is anticipated that this study will demonstrate which protocol is more effective at treating patients for alcohol withdrawal in the inpatient setting.
**Conference Abstracts**  
**May 16-18, 2022**

**Presenter Name:** Boulos, Marina  
**Organization:** Marina Boulos, PharmD [1]; Kristin Bohnenberger, PharmD, DABAT [1,2]. [1]  
Department of Pharmaceutic  
**Category:** Emergency Medicine  
**Day | Session | Room | Time:** Poster

**Authors:** Marina Boulos, PharmD [1]; Kristin Bohnenberger, PharmD, DABAT [1,2]. [1]  
Department of Pharmaceutical Services, Penn Medicine Princeton Medical Center, Plainsboro, NJ. [2] Ernest Mario School of Pharmacy at Rutgers, the State University of New Jersey, Ne

**Title:** Evaluation of analgesic use in renal calculi patients at a community hospital

**Objectives:** Patients with renal colic from nephrolithiasis typically present with severe, sudden-onset, unilateral flank or abdominal pain. Both non-steroidal anti-inflammatory drugs (NSAIDs) and opioids are indicated for pain relief in this situation. In opioid-naive patients presenting with renal colic, the use of the lowest effective dose of non-opioid analgesic medications (i.e. ketorolac) can improve patient outcomes. The objective of this study is to evaluate current analgesic prescribing patterns, educate providers on areas for improvement, and assess the impact of a pharmacist-led education on prescribing patterns.

**Methods:** This study is a twofold, retrospective, single-center chart review. The initial chart review included opioid-naive patients that presented to the emergency department (ED) with renal colic due to renal calculi between April 1, 2021 and September 30, 2021. Data collected included: age, gender, home medications, nephrolithiasis severity (i.e. pain scores, location, and number of stones), and management strategies (i.e. analgesics and doses administered, prescriptions on discharge). Next, ED providers were presented with a synopsis of initial findings as well as educated on areas where analgesic use could be optimized. This was followed by a post-education chart review to evaluate the impact of the pharmacist's education on analgesic prescribing between January 26, 2022 and February 28, 2022. Inclusion and exclusion criteria, primary and secondary endpoints, and data points collected in the second chart review were identical to those in the first. All patient specific information was de-identified and maintained electronically in password protected files.

**Results:** The percent change in the number of opioids administered and prescribed between pre and post provider education will be recorded and results will be presented. Data will be evaluated using descriptive statistics and a Chi squared test.

**Conclusions:** It is anticipated that this project will demonstrate the impact of pharmacist-based prescriber education to reduce opioid prescribing in the setting of renal colic management in the emergency department.
**Title:** Evaluation of analgesic use in renal calculi patients at a community hospital

**Objectives:** Patients with renal colic from nephrolithiasis typically present with severe, sudden-onset, unilateral flank or abdominal pain. Both non-steroidal anti-inflammatory drugs (NSAIDs) and opioids are indicated for pain relief in this situation. In opioid-naïve patients presenting with renal colic, the use of the lowest effective dose of non-opioid analgesic medications (i.e. ketorolac) can improve patient outcomes. The objective of this study is to evaluate current analgesic prescribing patterns, educate providers on areas for improvement, and assess the impact of a pharmacist-led education on prescribing patterns.

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**Conclusions:** It is anticipated that this project will demonstrate the impact of pharmacist-based prescriber education to reduce opioid prescribing in the setting of renal colic management in the emergency department.
**Objectives:** Etomidate and ketamine are two commonly used induction agents for rapid sequence intubation, but conflicting data regarding their subsequent hemodynamic effects has made it unclear whether there is a superior sedative agent for critically ill patients. The purpose of this study is to compare the incidence of post-intubation hypotension between etomidate and ketamine following rapid sequence intubation.

**Methods:** A retrospective chart review was conducted of all adult patients who received either etomidate or ketamine as an induction agent for rapid sequence intubation from January 1, 2019 to July 31, 2021. Exclusion criteria included pregnancy, intranasal intubation, cardiac arrest on arrival, and patients with undocumented pre-and post-intubation vitals. The primary outcome was the incidence of hypotension, defined as either systolic blood pressure (SBP) < 90 mmHg, mean arterial pressure < 65 mmHg, ≥ 20% decrease in SBP, or vasopressor initiation post-intubation, which were assessed at the time intervals of 15 minutes, 1 hour, and 24 hours post-induction.

**Results:** Induction with ketamine as compared to etomidate was associated with a higher incidence of post-intubation hypotension at 15 minutes (59.1% vs. 37.9%, p < 0.001). At 1-hour post-intubation, there was no significant difference in the incidence of hypotension between ketamine and etomidate (33.6% vs. 44.8%, p = 0.06). Induction with etomidate was associated with a higher incidence of post-intubation hypotension at 24 hours (17.3% vs. 35.5%, p < 0.001).

**Conclusions:** Patients receiving ketamine for induction during intubation may be at an increased risk of hypotension at 15 minutes post-intubation compared to those who receive etomidate. However, the risk of hypotension secondary to ketamine use appears to decrease over time, while the risk associated with etomidate use may remain largely unchanged, resulting in an increased risk of hypotension at 24 hours in patients treated with etomidate.
Pharmacist impact on alteplase door-to-needle times at a primary stroke center

Authors: M. Brooks, N. Lizer, K. Morgan; Winchester Medical Center, Winchester, Virginia

Title: Pharmacist impact on alteplase door-to-needle times at a primary stroke center

Objectives: For acute ischemic stroke (AIS), reducing the door-to-needle (DTN) time for thrombolysis is associated with improved outcomes and reduced morbidity. The American Heart Association stroke guidelines recommend that fibrinolytic therapy be administered within 60 minutes of patient arrival, with a secondary goal of administration within 45 minutes. At Winchester Medical Center, a primary stroke center, the addition of two Emergency Department (ED) pharmacists to stroke response has streamlined administration of thrombolytic therapy. The pharmacists assisted with determining alteplase eligibility, addressing eligibility concerns such as blood pressure, patient medication history, dose calculation, and alteplase preparation. The objective of this study was to determine the clinical impacts of pharmacists responding to code strokes.

Methods: This retrospective, cohort study included patients who received alteplase for suspected AIS from August 1, 2019 through January 31, 2022 in the ED. Clinical and demographic data was collected through chart review and stroke-center records. Since an ED pharmacist responded to ED code strokes between 10:30 and 21:00, patients who received alteplase during this time were included in the ED-RPh-Present cohort while all other patients were included in the NO-ED-RPh cohort. The primary outcome was door-to-needle (DTN) time. Secondary outcome measures included comparisons of imaging-to-needle time (ITN), image-to-alteplase order time, alteplase order-to-needle time, and percentage of patients who received alteplase within 60 and 45 minutes. Secondary outcomes also evaluated pharmacist impact on interventions, medication histories, and blood pressure management.

Results: A total of 96 patients were included. A DTN time \( \leq 60 \) minutes was achieved in 54.9% in the ED-RPh-Present cohort \( n=71 \) versus 28.0% No-ED-RPh \( n=25 \) \( p=0.02 \), which corresponded with a significantly improved DTN time \( \text{median } 58.5 \text{ vs } 76.0 \text{ minutes, } p=0.003 \). There was no difference in percentage of DTN \( \leq 45 \) minutes \( 16.0\% \text{ vs } 22.5\%, p=0.49 \). Time from ED arrival to imaging was similar between cohorts \( \text{median } 12 \text{ vs } 14 \text{ minutes, } p=0.38 \). The time from imaging to alteplase order was significantly shorter in the ED-RPh-Present cohort \( \text{median } 29 \text{ vs } 42 \text{ minutes, } p=0.031 \), as was order-to-needle time \( \text{median } 7 \text{ vs } 13 \text{ minutes, } p<0.001 \). Overall, the ITN was significantly shorter in the ED-RPh-Present cohort.
Brooks, Matthew

Pharmacist impact on alteplase door-to-needle times at a primary stroke center

(median 36 vs 57 minutes, p<0.001). The ED-RPh-Present cohort more commonly had alteplase mixed at bedside (98.6% vs 56.0%), which may influence the DTN time.

**Conclusions:** The addition of an ED pharmacist to AIS response is associated with decreased time to alteplase administration. The impact of the pharmacist is most noticeable in the post-imaging to alteplase administration period.
Variable versus Fixed-Dose Four-Factor Prothrombin Complex Concentrate for Factor Xa Inhibitor Reversal

Objectives: Compared to variable-dose four-factor prothrombin complex concentrate (4F-PCC), fixed-dose 4F-PCC provides similar hemostatic efficacy, safety, will decrease time to administration, and provide cost-savings for non-intracranial, non-traumatic factor-Xa (FXa) inhibitor associated major bleeding.

Methods: This was a multi-center, retrospective, observational study. Patients with non-traumatic, non-intracranial FXa inhibitor associated major bleeding who were reversed with either a variable-dose (50 units/kg) or a fixed-dose (2000 units) of 4F-PCC were included. Patients on anticoagulation other than FXa inhibitors, those without major bleeding, or intracranial or traumatic bleeding were excluded. The primary outcome was hemostatic effectiveness at 48 hours. Secondary outcomes included the incidence of thrombosis or death at 30 days, time to 4F-PCC administration, and cost of 4F-PCC treatment.

Results: Fifty-seven patients were included with 38 patients receiving fixed-dose 4F-PCC and 19 patients receiving variable-dose 4F-PCC. Apixaban was the most common FXa inhibitor reversed, and gastrointestinal bleeding was the most common type in both groups. Hemostatic effectiveness was achieved in 22 of 38 patients (57.9%) in the fixed-dose group and in 7 of 19 patients (36.8%) in the variable-dose group (p = 0.2). There was no significant difference in thrombosis or death at 30 days as well as time to administration. Treatment costs were lower in the fixed-dose 4F-PCC group.

Conclusions: Among patients with non-intracranial, non-traumatic FXa inhibitor associated major bleeding, the use of fixed-dose 4F-PCC yielded similar hemostatic effectiveness compared to variable-dose 4F-PCC, and was associated with lower drug cost.
Authors: A Cook PharmD; J Rosini PharmD, MS; M Perza PharmD, BCPS; L Schneider, PharmD, BCPS, BCCCP

Title: Evaluation of delays in alteplase infusion following the initial bolus and impact on outcomes in patients with acute ischemic stroke

Objectives: Acute ischemic stroke (AIS) is a neurologic emergency which results from a blockage in a cerebral artery leading to reduced blood flow to the brain and neurologic injury. The treatment of AIS involves the use of alteplase which is most beneficial when given early in AIS and therefore door-to-needle (DTN) times of less than 30 minutes are recommended by the American Heart Association. To meet the DTN goal of less than 30 minutes, institutions may administer the alteplase bolus immediately following negative results of the non-contrast CT scan, but the start of alteplase infusion may be delayed for various reasons. A pharmacokinetic study evaluated the delay in alteplase infusion initiation and found that a delay of 5, 15, and 30 minutes after the bolus led to reduced alteplase concentrations. With a short half-life (~5 min) causing a reduction of alteplase concentrations, it is unknown how a prolonged delay to initiate the alteplase infusion following the bolus impacts outcomes. The objective of this analysis is to assess if a delay in initiation of the alteplase infusion following the initial bolus dose impacts outcomes in patients with acute ischemic stroke.

Methods: Adult patients who received alteplase for the treatment of acute ischemic stroke in the emergency department between October 2015 through October 2021 will be included in this analysis. Patients will be excluded if they received alteplase at an outside hospital; received mechanical thrombectomy; lack documentation of admission or discharge NIHSS; or if pregnant. The primary outcome will evaluate the change in the NIHSS from admission to discharge in patients with less than or equal to a five-minute difference compared to patients with greater than a five-minute difference from alteplase bolus to infusion. Secondary outcomes will evaluate the admission and discharge NIHSS compared to 90-day mRS, discharge location, in-hospital mortality, and 3-month mortality.

Results: 1229 patients met the inclusion criteria. 280 patients had a delay of >5 minutes and 949 patients had a delay of â‰¤ 5 minutes. The results of the primary outcome, median change in NIHSS from admission to discharge, was a decrease of 3 points in each group. The remaining results will be summarized and presented.
Conclusions: This analysis may add to possible workflow changes in the administration of alteplase or lead to the shift to using a different fibrinolytic agent for the treatment of acute ischemic stroke.
Clinical features and therapeutic implications in community-acquired versus nosocomial spontaneous bacterial peritonitis

**Objectives:** Third-generation cephalosporins have traditionally been recommended as first-line treatment in all patients with cirrhosis and spontaneous bacterial peritonitis (SBP) based upon bacterial epidemiology that is now outdated. Recent studies have revealed distinctions between community-acquired (CA-SBP) and nosocomial (N-SBP) cases, such as increased prevalence of multidrug-resistant organism (MDRO) infection associated with N-SBP. Professional organizations such as the American Association for the Study of Liver Diseases (AASLD) have since updated guidance to include consideration of broader empiric antibiotics in patients at increased risk of MDRO; however, specific recommendations are limited due to lack of sufficient evidence. The purpose of this study is to characterize features and outcomes of CA-SBP and N-SBP and compare the clinical implications of antibiotic agents used as empiric treatment at an academic medical center.

**Methods:** Medical records of patients with cirrhosis and SBP admitted to BIDMC during a three-month period were reviewed. A diagnosis of SBP was confirmed in patients with a documented absolute polymorphonuclear (PMN) cell count of 250 or greater in the absence of a secondary cause of infection. N-SBP was defined as an infection diagnoses greater than 48 hours after admission. Each case was reviewed for evidence of treatment failure, and demographic as well as microbiological data was collected to assess for features that may be associated with poor outcomes.

**Results:** The number and percentage of cases that resulted in treatment failure will be recorded and results will be presented.

**Conclusions:** This project will better characterize the therapeutic implications of CA-SBP and N-SBP to help identify populations at risk for treatment failure who may benefit most from broader-spectrum empiric antibiotic therapy.
Incidence of hypoglycemia following the hyperkalemia protocol in the emergency department

**Presenter Name:** D'Allesandro, Nicasia  
**Organization:** Christianacare  
**Category:** Emergency Medicine  
**Day | Session | Room | Time:** Wednesday | 5 | Empire C | 1:45:00 PM

**Authors:** N. D'Allesandro; K. Abdelmessieh; S. Gandotra; N. Jacob

**Title:** Incidence of hypoglycemia following the hyperkalemia protocol in the emergency department

**Objectives:** Patients with clinically significant hyperkalemia (potassium >5 mmol/L) can receive 10 units of insulin regular intravenously (IV) as part of a protocol in the Emergency Department (ED) to decrease potassium and prevent dangerous arrhythmias. ChristianaCare's current protocol includes: 10 units of IV insulin regular, 25 g of IV 50% dextrose, 15 mg of nebulized albuterol, sodium bicarbonate, calcium gluconate, and furosemide. Hyperkalemia is estimated to occur in 0.36%-2.6% of ED visits. Administering 10 units of insulin for the treatment of hyperkalemia may cause hypoglycemia (blood glucose [BG] <70 mg/dL) in 8.7% of patients and cause severe hypoglycemia (BG <40 mg/dL) in 2.3%. This retrospective, case-cohort, chart review aims to determine the incidence of hypoglycemia, deviation from the protocol of three glucose altering medications, and determine if the current standard of practice is safe at three EDs.

**Methods:** Patients who received the ED's hyperkalemia protocol from July 1st 2020 through July 1st 2021 were evaluated and followed for 8 hours after insulin administration. Patients were excluded if they were <18 years of age, pregnant, not in the ED, did not receive insulin, did not receive the protocol, or did not receive a BG level within 8 hours of insulin regular receipt. The data collected was analyzed through SPSS software using Pearson's chi-squared and Mann-Whitney U tests for statistical analysis.

**Results:** A total of 549 patients were ordered the hyperkalemia protocol and 150 patients were randomly selected for analysis. In the sample, 14% of patients had hypoglycemia and 2% of patients had severe hypoglycemia. Deviation from the protocol was seen in 64.7% of patients. The highest deviation was the lack of albuterol (50%), followed by an insulin dose other than 10 units (22%), and lack of dextrose (9%). There was not a statistically significant difference in hypoglycemia in those patients who received medications deviating from the protocol compared to those that received all three. The median times to first BG check and hypoglycemic event were 2.5 (IQR 1.5-4.3 hours) and 2.8 hours (IQR 1.8-4.9 hours), respectively. Hypoglycemia was found with the first BG check in 67% of patients. African Americans, the absence of diabetes, and a lower baseline BG, were factors that significantly increased the risk of developing hypoglycemia (p=0.03, 0.048, 0.016, respectively).
**Conclusions:** In patients ordered the hyperkalemia protocol, the incidence of hypoglycemia in this study was higher compared to previous reports (14% vs 8.7%). The results of the analysis identified several areas where the current protocol can be improved to enhance patient safety. Serum BG checks could be drawn earlier to catch hypoglycemia sooner. Patient specific risk factors could play a larger role in the protocol prescribing to minimize hypoglycemia.
Deibler, Karlee

Intravenous diltiazem dosing strategies for atrial fibrillation with rapid ventricular response in the emergency department

Conference Abstracts
May 16-18, 2022

Presenter Name: Deibler, Karlee
Organization: Penn State Milton S Hershey Medical Center
Category: Emergency Medicine
Day | Session | Room | Time: Monday | 1 | Empire C | 2:00:00 PM

Authors: Karlee Deibler, PharmD; Sarah DiVello, PharmD, BCPS; Terra Landis, PharmD, BCCCP; Sarah Livings, PharmD, BCPS, BCCCP

Title: Intravenous diltiazem dosing strategies for atrial fibrillation with rapid ventricular response in the emergency department

Objectives: The 2014 AHA/ACC/ARS Guideline for Management of Patients with Atrial Fibrillation recommend intravenous diltiazem 0.25 mg/kg as one of the first line rate control agents for atrial fibrillation. However, the guidelines do not specify which weight to use (actual vs ideal) and prescribers may be hesitant to order a standard weight-based dose over concerns for hypotension. However, using lower than recommended doses may lead to inadequate heart rate reduction and lead to complications of uncontrolled atrial fibrillation. Previous research has not reached a definitive consensus on what dosing strategy is the best in regards of achieving adequate heart rate control while also preventing adverse events, including hypotension. The rationale of this study is to compare the two groups of patients (patients that received weight-based dosing of IV diltiazem and those who did not) to determine if there is a difference in the incidence of heart rate reduction to < 110bpm within 15-30 minutes of the diltiazem bolus, as well as the incidence of adverse events.

Methods: This is a retrospective analysis of electronic health records conducted on patients aged 18 and older who were diagnosed with atrial fibrillation (AF) with rapid ventricular response (RVR) by ICD-10 diagnosis code and received intravenous (IV) diltiazem for AF with RVR in the ED at Penn State Hershey Medical Center from September 1, 2015 to August 31, 2021. The study is approved by the Institutional Review Board. Baseline demographics, diltiazem dose, heart rate, and blood pressure were collected for each patient before and after receiving the dose of IV diltiazem. The primary outcome is heart rate reduction <110bpm within 15-30 minutes of diltiazem bolus. Secondary safety outcomes include heart rate (HR) < 60bpm, mean arterial pressure (MAP) < 65mmHg, systolic blood pressure (SBP) <90mmHg, or a SBP decrease of 20mmHg or more from baseline.

Results: 604 patients will be included in the final analysis, 178 patients who received a weight-based dose (0.25 mg/kg Â± 10%) and 426 patients who received less than a weight-based dose. At the time of this submission, results have not yet been finalized.

Conclusions: It is expected that patients that received less than a weight-based dose of diltiazem in the ED for AF with RVR will be less likely to achieve heart rate reduction <110bpm
within 15-30 minutes of the diltiazem bolus. Additionally, patients who received a weight-based dose are not suspected to be at an increased risk of adverse events. The results of this study may impact the recommendation of weight-based dosing strategies for IV diltiazem for AF with RVR at our institution.
**Authors:** Emily J. Farina, PharmD; Deepali Dixit, PharmD, BCPS, BCCCP, FCCM; Marc Sturgill, PharmD; Robert Wood Johnson University Hospital Department of Neurocritical Care

**Title:** Evaluating the safety and efficacy outcomes between tenecteplase and alteplase for acute ischemic stroke

**Objectives:** Alteplase is the only FDA-approved thrombolytic agent for the treatment of acute ischemic stroke (AIS), however administration of this agent has resulted in incomplete and delayed reperfusion. Tenecteplase, another thrombolytic agent, has several advantages over alteplase, which include longer half-life and faster administration time. The purpose of this study is to assess whether there is a difference in safety and efficacy between tenecteplase and alteplase at our institution in terms of clinically significant bleeding and door-to-needle time (DTN).

**Methods:** Medical records of patients with a final diagnosis of AIS at Robert Wood Johnson University Hospital in New Brunswick, New Jersey during a one-year period were reviewed. Patients were included if they had received alteplase or tenecteplase within 4.5 hours of symptom onset during the study time frame. The following data points were collected and assessed: relevant comorbidities; antithrombotic agent use; admission, 24-hour, and discharge NIH Stroke Scale (NIHSS) score, presence of bleeding, DTN, and discharge modified Rankin score (mRs). Data was collected from the institutional stroke database and compared using the Mann-Whitney Rank Sum test and Chi-square test.

**Results:** Data from a total of 110 patients was collected in the study. Three patients in the tenecteplase group and two patients in the alteplase group experienced clinically significant bleeding. The difference in bleeding was not statistically significant. There was also no statistically significant difference in in-hospital mortality between the groups. A statistically significant median DTN was shown with tenecteplase (32 minutes) compared to alteplase (40 minutes) (p=0.022). There were no significant differences in baseline characteristics between groups.

**Conclusions:** The results of this study suggest that the institutional decision to switch from alteplase to tenecteplase as the primary agent for AIS did not increase bleeding episodes. In addition, the demonstration of reduced DTN time with tenecteplase may contribute to future efficacy studies.
Impact of morphine on cardiovascular outcomes in patients with ST-segment elevation myocardial infarction

Objectives: Recent studies have shown inconsistent outcomes amongst patients with ST-segment elevation myocardial infarction (STEMI) who received morphine versus those who received other analgesic agents. While these studies compared outcomes after morphine administration against a singular alternative agent or no agent, the effect of morphine on cardiovascular outcomes compared to multiple non-morphine analgesic agents has not been investigated. Therefore, the purpose of this study is to compare the impact on cardiovascular outcomes in patients who present to the emergency department with STEMI and received morphine versus patients with STEMI who received non-morphine analgesics, including no analgesia.

Methods: Data was collected and recorded from review of medical records of patients who presented to a network emergency room between January 1st, 2018 and August 31st, 2021. Patients were included in the study if they presented with STEMI and underwent treatment with percutaneous coronary intervention (PCI) or fibrinolytics. The primary outcome of this study is major adverse cardiac events, including thrombosis, revascularization, reinfarction, and cardiac death within 72 hours after treatment with PCI or fibrinolytic therapy.

Results: Data was collected for a total of 305 patients with 77 in the morphine group and 228 patients in the non-morphine group. Baseline characteristics were similar between both groups. Data analysis showed no statistically significant differences between patients who received morphine compared to those who received non-morphine in the primary outcome and secondary outcomes. A major adverse cardiac event occurred in 2 (2.59%) of the patients in the morphine group and 16 (7.02%) of patients in the non-morphine group (p= 0.26).

Conclusions: The results of this study demonstrated that morphine is not associated with an increase in the risk of cardiovascular events after administration to patients with STEMI. Based on the results of this study, morphine can be safely given prior to fibrinolytics or PCI.
Authors: Karch Helsel; Jesse Dorchak

Title: Pharmacist impact on tissue plasminogen activator door-to-needle time for stroke response in the emergency department

Objectives: Administration of tissue plasminogen activator (tPA) during an ischemic stroke restores cerebral blood flow, which preserves tissue. Because of this, a quick door-to-needle (DTN) time to administer tPA can prevent cerebral tissue loss. Evidence has shown that having a pharmacist present during a stroke alert reduces DTN time for tPA. In addition to reducing time to tPA administration, a pharmacist present increases the likelihood of a patient receiving the tPA within the recommended goal time of less than 60 minutes. Studies also show that achieving a DTN time of less than 60 minutes has shown to reduce all-cause mortality and all-cause readmission at one year. We hypothesize that tPA DTN time will be significantly decreased when a pharmacist is present in the ED during a stroke alert compared to when a pharmacist is not present at the stroke alert.

Methods: This study was conducted retrospectively as a single-centered cohort study at Conemaugh Memorial Medical Center (CMMC). Data was extracted from either the electronic medical records or from data collected by the stroke coordinator. The study included patients who are 18 years of age or older and received tPA for ischemic strokes in the CMMC ED from April 2018 to April 2022. The cohort was separated into two groups divided by the date that a pharmacist started responding to stroke alerts in the ED to assess our primary objective. Additionally, patients that received tPA after a pharmacist started responding to stroke alerts in the ED was then further separated into two groups divided by whether or not a pharmacist was present at the stroke alert to assess any indirect impacts of pharmacy ED presence.

Results: The results are in progress and will be presented.

Conclusions: It is anticipated that this project will show value in having a dedicated emergency room pharmacist as a part of the stroke response team.
Don't bite the hand that feeds you - optimizing the use of rabies vaccine and immunoglobulin

Authors: H. Hezzini, M. Lamb, S. Moreau; Jersey City Medical Center, Jersey City, New Jersey

Title: Don't bite the hand that feeds you - optimizing the use of rabies vaccine and immunoglobulin

Objectives: The number of human rabies cases has dramatically reduced over the years through successful animal control programs, vaccination, and timely administration of post-exposure prophylaxis (PEP). Previous studies and institutional data have suggested an over-prescribing of rabies PEP. The purpose of this study is to determine if emergency department decision making tools increase appropriate use of PEP and evaluate feasibility of dose-rounding immunoglobulin.

Methods: This is a single-center quality improvement study consisting of a three-month pre-implementation retrospective chart review and a three-month post-implementation evaluation period. Patients of all ages with animal exposure and active encounter at our institution were included. Patients under 75 kilograms were excluded from dose rounding. The implementation tools included a standardized assessment tool to guide provider decision-making, note template for consistent documentation, and a weight-based dose-rounding human rabies immunoglobulin chart. Data collection included patient demographics, vaccination status, the nature of animal exposure and classification, ability to acquire animal for testing or observation, number of vaccine doses given, dose of immunoglobulin given, and diagnosis code(s) utilized. The primary endpoint consisted of percent appropriate use of human rabies immunoglobulin and vaccine pre- and post-implementation. Secondary endpoints include utilization of assessment and documentation tools and cost estimation in vials of rabies immunoglobulin saved. Chi square analysis and descriptive statistics will be utilized to analyze endpoints.

Results: Data collection and analysis is ongoing, and results will be presented. In the retrospective cohort from January to December 2019 (n=84) and July to September 2021 (n=23), it was found that 44% and 56% of patients respectively received rabies post-exposure prophylaxis (PEP) when it was likely not indicated. In the post-implementation group from January to March 2022 (n=18), 38% of patients received rabies PEP when it was likely not indicated. Analysis of secondary endpoints found that 71% of rabies immunoglobulin doses were appropriately rounded, two vials were saved as a result of dose-rounding. Results of cost estimation in vials saved will be presented.
Conclusions: It is anticipated that the use of standardized assessment tools developed to help guide recommendations aimed at optimizing the use of rabies post-exposure prophylaxis will improve patient and provider awareness and decisions. Limitations of this study include pending approval of the standardized documentation tool into electronic medical records and low utilization of dose-rounding policy. Barriers include variable patient health literacy, unable to create electronic health record changes for dose rounding, high staff turnover and additional need for education, and inadequate patient follow-up.
**Conference Abstracts**  
May 16-18, 2022

**Presenter Name:** Iluyomade, Abisola  
**Organization:** University of Maryland Capital Region Medical Center  
**Category:** Emergency Medicine  
**Day | Session | Room | Time:** Wednesday | 6 | Empire A | 3:00:00 PM

**Authors:** Abisola Iluyomade, PharmD and Pan Pan Wong, PharmD, MSEd, BCCCP

**Title:** Timeliness of Antibiotic Administration in Emergency Department Patients with Sepsis and Septic Shock

**Objectives:** Sepsis is a life-threatening condition affecting over 1 million patients in the United States each year. It occurs when the body's response to an infection causes potentially life-threatening organ dysfunction. Septic shock is a result of tissue hypoperfusion and presents as hypotension and elevated serum lactate levels. Timely treatment of sepsis with empiric antibiotic therapy is associated with decreased mortality and improved patient outcomes. The Surviving Sepsis Campaign (SSC) strongly recommends empiric broad-spectrum antibiotics be given within 1 hour of sepsis identification to patients with or without septic shock. The purpose of this study is to determine if the implementation of quality improvement efforts in the Emergency Department (ED) will reduce the time of antibiotic administration to be within the one-hour recommended timeframe.

**Methods:** This study is a single-centered, retrospective, pre-post intervention at a community teaching hospital. The pre-intervention data includes adult (18 years and older) patients seen in the ED with sepsis or septic shock from October 1, 2021 to November 30, 2021. The quality improvement interventions include provider and nursing education presentations and handouts about the importance of empiric sepsis treatment within 1 hour of presentation and ensuring that appropriate sepsis medications are standard stock in the ED automated dispensing cabinets. These interventions occurred in January of 2022. Post-intervention data includes adult ED patients who received empiric antibiotics for the treatment of sepsis and septic shock from February 1, 2022 to March 31, 2022. The primary endpoint is the length of time from presentation to administration of antibiotics. Secondary endpoints include the length of time from presentation to antibiotic order and the length of time from antibiotic order to administration.

**Results:** The average lengths of time from presentation to administration of antibiotics, presentation to antibiotic order, and antibiotic order to administration will be recorded and results will be presented.

**Conclusions:** It is anticipated that this project will demonstrate a role for pharmacist-led nursing education in order to increase adherence to the Surviving Sepsis Campaign (SSC) recommendation of empiric sepsis treatment within 1 hour of presentation.
Conference Abstracts
May 16-18, 2022

Presenter Name: Ismail, Omar
Organization: Ocean University Medical Center; Southern Ocean Medical Center
Category: Emergency Medicine
Day | Session | Room | Time: Tuesday | 3 | Empire D | 2:00:00 PM

Authors: Ismail, O., Fridman Malamud, V., Nayyar, D

Title: Evaluation of tenecteplase versus alteplase in the treatment of acute ischemic stroke

Objectives: In October 2021, OUMC's and SOMC's institutional acute ischemic stroke (AIS) guidelines were updated to recommend the use of tenecteplase over alteplase for treatment of AIS as per recommendations from the 2019 American Heart Association guidelines. The primary objective of this study is to evaluate the neurological improvement based on the National Institute of Health Stroke Scale (NIHSS) score from baseline to 24 hours after administration of tenecteplase as compared to alteplase. Some of the secondary objectives include evaluation of hemorrhagic conversions, dosing and administration errors, and total door to needle time between both agents.

Methods: A retrospective evaluation was conducted for patients who received alteplase or tenecteplase for AIS between January 2021 to March 2022. Neurological improvement was assessed based on the NIHSS score from baseline to 24 hours after administration of tenecteplase versus alteplase, door to needle time was evaluated by comparing the time from patient arrival to administration of tenecteplase versus alteplase, and complications such as hemorrhagic conversions were evaluated by reviewing the CT/MRI imaging studies and/or documentation in the Electronic Medical Record (EMR). To capture the dosing and administration errors, the documentation in the EMR and/or in the error reporting system was reviewed.

Results: The mean difference in NIHSS score from baseline to 24 hours, total door to needle time, dosing and administration errors, and hemorrhagic conversions between alteplase and tenecteplase will be recorded and results will be presented.

Conclusions: It is anticipated that these findings will validate the change in practice for the use of tenecteplase for AIS.
Conference Abstracts
May 16-18, 2022

Presenter Name: Jallen, Sarah
Organization: Geisinger Medical Center
Category: Emergency Medicine
Day | Session | Room | Time: Tuesday | 4 | Empire C | 3:45:00 PM

Authors: S. Jallen, A. Linkhorst, L. Brickett; Geisinger Medical Center (GMC), Danville, Pennsylvania

Title: Effects of ketamine versus etomidate on systolic blood pressure during intubation of traumatic brain injury patients

Objectives: In patients with traumatic brain injury (TBI), systemic hypotension is a well-known predictor of increased mortality and leads to cerebral hypo-perfusion and ischemia, resulting in death and disability. Airway management with rapid sequence intubation (RSI) is critical in this population. Ketamine and etomidate are commonly used for induction due to their rapid onset and favorable properties, although it is unclear which one leads to less hypotension. The purpose of this study will be to evaluate the change in systolic blood pressures (SBP) after administration of either ketamine or etomidate in TBI patients.

Methods: This is a retrospective chart review of adult patients with TBI who received either ketamine or etomidate for induction before RSI from January 2016 to June 2021 at two of our health system's emergency departments. Patients were excluded if they were intubated pre-hospital, missing blood pressure data, given both etomidate and ketamine, pronounced dead on arrival, transferred from another hospital, or given vasopressors prior to induction. The primary outcome is to evaluate the change in SBP after induction with ketamine versus etomidate. Secondary outcomes include post-drug hypotension and post-drug hypertension.

Results: Baseline demographic and clinical characteristics will be compared between subjects including shock index, blunt versus penetrating trauma, and presence of intracranial hemorrhage. Comparison of systolic blood pressures, post-drug hypotension and post-drug hypertension between groups will be presented.

Conclusions: It is anticipated that this project will demonstrate that induction with ketamine will result in less hypotension than etomidate in patients with TBI undergoing RSI in the emergency department.
Evaluation of hydroxocobalamin use for the treatment of suspected cyanide toxicity secondary to smoke inhalation

Objectives: Hydroxocobalamin is the preferred treatment for cyanide toxicity secondary to smoke inhalation. However, diagnosis is challenging due to lack of rapid confirmatory testing. Retrospective studies have associated hydroxocobalamin with risk of acute kidney injury (AKI), raising safety concerns. This study aims to evaluate the proportion of patients who met pre-defined use criteria for the administration of hydroxocobalamin to treat suspected cyanide toxicity, secondary to smoke inhalation.

Methods: This was a retrospective, observational analysis of patients with suspected cyanide toxicity secondary to smoke inhalation, from 3/11/2011 to 8/31/2021, whom received hydroxocobalamin. The primary outcome was the proportion of patients meeting appropriate use criteria defined as one of the following at presentation: serum lactate ≥ 8 mmol/L, systolic blood pressure (SBP) < 90 mmHg, new-onset seizure, cardiac arrest, or respiratory arrest. Secondary outcomes included the incidence of AKI and pneumonia occurring during the hospitalization, resolution of neurologic symptoms present on admission, and in-hospital mortality. Descriptive statistics were used to describe the population and proportion meeting use criteria and secondary outcomes, and Mann Whitney U and Fisher's Exact tests were used to compare those that met use criteria and those that did not for continuous and dichotomous data, respectively.

Results: Forty-six patients met inclusion criteria, of which 35 (76.1%) met the primary outcome. Respiratory arrest was the leading reason for meeting appropriate use criteria, occurring in all 35 patients. Additional use criteria were met in 42.9% of patients for high serum lactate, 40% for low SBP, and 34.3% for incidence of cardiac arrest; no seizures occurred. There were differences in the rate of intubation (100% vs. 54.5%, p<0.001), mean lactate (9.4 ± 5.5 mmol/L vs. 4.8 mmol/L Â± 1.5, p=0.078), and mean SBP on presentation (124 ± 36.3 mmHg vs. 150 Â± 17.7 mmHg, p=0.047) between those meeting appropriate use criteria and those that did not, respectively. Overall, AKI occurred in 28.3% of patients, pneumonia in 19.6%, and resolution of neurologic symptoms in 45.7% with no significant differences between those
meeting appropriate use criteria and those not. However, in-hospital mortality was higher in patients meeting use criteria, 48.6% vs. 9.1% (p=0.03).

**Conclusions:** A set of appropriate use criteria identifies severely ill smoke inhalation victims and may provide useful guidance for clinicians considering hydroxocobalamin treatment in these patients.
Authors: Darien Lee, PharmD; Andrew Vassallo, PharmD, BCPS, BCCCP; Marina Pittiglio, PharmD, BCCCP; Joseph Cavanaugh, PharmD, BCPS, BCCCP

Title: Emergency department-initiated buprenorphine for opioid use disorder: impact on patient outcomes at a community hospital

Objectives: The objective of this study is to evaluate the impact of an ED-initiated buprenorphine protocol in comparison to standard of care on various patient outcomes within 30 days of initial discharge from the hospital.

Methods: This ambidirectional cohort study evaluated data collected from the Peer Recovery Program (PRP). This study included adults who met criteria for opioid use disorder (OUD), sought outpatient detoxification/treatment with buprenorphine, experienced opioid withdrawal, were offered PRP services, and were admitted to the ED between October 2020 and January 2021 or between October 2021 and January 2022. Patients were excluded if they required hospitalization, were actively participating in a methadone maintenance program, or had a history of allergic reactions to buprenorphine. The primary outcome was readmissions to the ED for OUD. Secondary outcomes included readmissions to the ED for any reason, opioid-involved overdoses requiring naloxone, admission to an opioid treatment program (OTP), number of successful follow-ups with the PRP, and acceptance of PRP services. All outcomes were categorical and were evaluated using the Fisher's Exact test.

Results: A total of 327 patients were screened, of which 85 met criteria for the study. Among these patients, 46 were included in the retrospective portion of the study and 39 were included in the prospective portion of the study. A total of 7 patients in the retrospective group had at least one readmission to the ED for OUD compared to 2 patients in the prospective group (p=0.17); 12 patients in the retrospective group with a readmission to the ED for any reason compared to 5 patients in the prospective group (p=0.18); 6 patients in the retrospective group with an overdose requiring naloxone compared to 0 patients in the prospective group (p=0.03). Acceptance of Recovery Specialist and Patient Navigator services were 98% and 26% in the retrospective group and 90% and 44% in the prospective group, respectively (p=0.17 and p=0.11). Admission to an OTP was 9% in the retrospective group and 15% in the prospective group (p=0.32). The number of patients who followed up at least once with the PRP was 41% in the retrospective group and 44% in the prospective group (p=1). Adherence to protocol was 21%.
Conclusions: With the exception of readmissions involving overdoses requiring naloxone, all readmission rates were not significantly lowered. Acceptance and utilization of PRP services and admission to an OTP were also not significantly reduced. The protocol's low adherence rate and study's small population size likely led to reduced power. Future directions involve further education and monitoring of the protocol.
**Presenter Name:** Lew, Jason  
**Organization:** The University of Vermont Medical Center  
**Category:** Emergency Medicine  
**Day | Session | Room | Time:** Tuesday | 3 | Empire D | 1:15:00 PM

**Authors:** Jason K. Lew, PharmD; Kyle DeWitt, PharmD; Skyler Lentz, MD; Blake Porter, PharmD.

**Title:** Discontinuation of antimicrobials for emergency department patients with negative infectious disease cultures

**Objectives:** Antimicrobials prescribed in the emergency department (ED) use an empiric approach since the causative infectious organism is frequently unknown at the time of diagnosis. Final microbiology results are reported after the patients are discharged home. Unnecessary use of antimicrobials can contribute to antibiotic resistance and lead to adverse events that may be avoidable. This study examined the impact of antimicrobial discontinuation by an emergency medicine pharmacist (EMP) for negative microbiological test results in patients discharged from the ED.

**Methods:** This is a retrospective cohort study conducted at a rural, academic, level 1 trauma center and approved by the local institutional review board. Adult and pediatric patients were included if they were discharged from the ED on antimicrobial therapy with a subsequent negative infectious disease culture result between January 1, 2020-December 31, 2020. Infectious disease cultures included urine, abscesses, sexual transmitted infection, sputum, stool, lyme antibody, and nasopharyngeal viral swabs. Microbiological results are available through a shared folder in the electronic medical record. The EMP reviews all microbiological culture results for discharged patients Monday through Friday during day and evening hours in conjunction with a physician assistant. If an intervention is required, the patient is contacted and informed of the result and new plan of care by the EMP. The primary outcome was to evaluate the total days of antimicrobial therapy saved in patients with negative infectious disease cultures due to EMP intervention. Secondary outcomes included return ED visit within 30 days, readmission within 30 days, and documented Clostridioides difficile infection within 90 days.

**Results:** The results to be presented at Eastern States.

**Conclusions:** The conclusion to be presented at Eastern States.
Conference Abstracts  
May 16-18, 2022  

**Presenter Name:** Lewandowski, Jesse  
**Organization:** Jersey Shore University Medical Center - Hackensack Meridian Health, Neptune, New Jersey  
**Category:** Emergency Medicine  
**Day | Session | Room | Time:** Monday | 1 | Empire C | 1:30:00 PM

**Authors:** J. Lewandowski, L. Woloszczuk, M. Casias, J. McCracken - Jersey Shore University Medical Center - Hackensack Meridian Health, Neptune, New Jersey

**Title:** Evaluating Emergency Department Prescribing Practices for Community Acquired Pneumonia (ED-CAP)

**Objectives:** Community-acquired pneumonia (CAP) is a leading cause of death in the United States with inappropriate antibiotic therapy contributing to increased mortality as well as cost of care. At the time of CAP diagnosis, accurately assessing comorbidities and symptoms is imperative in determining an appropriate antibiotic regimen. This study aims to assess facility prescribing practices of treatment for patients diagnosed with CAP and discharged from the Emergency Department (ED), and to provide ED physicians with empiric antimicrobial treatment guidance.

**Methods:** This is a single-center, retrospective chart review of patients with CAP treated in the outpatient setting involving a 3-stage design composed of: pre-education data analysis of antibiotic selection (December 1, 2020 to February 28, 2021), clinician education, and post-education data analysis of antibiotic selection (December 1, 2021 to February 28, 2022). Patients were included if they were ≥18 years old, had a diagnosis of CAP, and were discharged from the ED on antibiotics, but were excluded if they were pregnant; incarcerated; admitted to an inpatient floor; admitted to the hospital in the 30 days prior to initial presentation; or had a COVID-19-positive test result in the 2 weeks prior to initial presentation. Endpoints of the study include appropriateness of antibiotic regimen prescribed, 30-day readmission rates, and allergic events.

**Results:** In the pre-education phase, 59 patients were reviewed. Thirty-seven patients were excluded from analysis and twenty-two patients were included for analysis. Fourteen of 22 patients (64%) were prescribed azithromycin at an appropriate dose and treatment duration; however, the treatment guidance document developed in the second stage of this study recommended avoiding azithromycin due to increasing resistance of Streptococcus pneumoniae to macrolide antibiotics. Thus, all azithromycin prescriptions were considered inappropriate. The remaining 36% of antibiotic regimens were also deemed inappropriate. Of the inappropriate regimens, 14/22 (64%) were due to antibiotic selection, 3/22 (13%) were due to inappropriate duration, and 5/22 (23%) were inappropriate for more than one reason. Five of 22 patients
(23%) were readmitted to the hospital within 30 days. No patients experienced an allergic event. All endpoints assessed prior to the educational session will be analyzed and reported for patients in the post education group and comparative findings will be reported when the analysis is complete.

**Conclusions:** The authors hypothesize that clinician education will promote increased antibiotic appropriateness in accordance with guidelines.
Lowrey, Kate

Evaluation of the Efficacy and Utilization of Diabetic Ketoacidosis Protocol

Conference Abstracts
May 16-18, 2022

Presenter Name: Lowrey, Kate
Organization: ChristianaCare Health System
Category: Emergency Medicine
Day | Session | Room | Time: Monday | 1 | Empire C | 1:15:00 PM

Authors: K Lowrey, R Fett, K Abdelmessieh, J Empfield. ChristianaCare Health System, Newark, DE

Title: Evaluation of the Efficacy and Utilization of Diabetic Ketoacidosis Protocol

Objectives: Diabetic Ketoacidosis (DKA) is a hyperglycemic crisis that accounts for approximately 203,000 emergency department (ED) visits and 188,000 hospitalizations per year. The American Diabetes Association provides guidelines for DKA treatment and literature has shown that protocolized treatment has decreased time to DKA resolution to a median of 9.2 hours from insulin initiation as well as reduced adverse events. The primary objective of this study is to quantify adherence to a systemwide DKA treatment protocol and determine time to DKA resolution.

Methods: This retrospective chart review evaluated 100 adult patients who were diagnosed with DKA in the ED between 1 December 2019 and 30 June 2021. Patients were included if initial laboratory values met the following thresholds: blood glucose >250 mg/dL, serum bicarbonate ≤15 mmol/L, anion gap >12, pH ≤7.24, and the presence of urinary or serum ketones. Exclusion criteria included age <18 years, pregnancy, discharged against medical advice prior to DKA resolution, or a diagnosis of either euglycemic or hyperglycemic hyperosmolar syndrome. The primary outcome of successful protocol adherence was defined as appropriate fluid resuscitation and insulin initiation within 2 hours of arrival, IV potassium repletion within 2 hours of indication, and addition of dextrose to fluids within 1 hour of blood glucose <200 mg/dL. Time to DKA resolution, subcutaneous (SC) insulin transition, adverse events, and length of stay were also collected for secondary outcomes. Statistical analysis was performed using SPSS software.

Results: Within the sample, 98% of patients had at least 1 deviation from the protocol and 69% had 4 deviations. Deviations occurred with insulin administration in 84% of patients, fluid resuscitation in 96% of patients, addition of dextrose in 73% of patients, and electrolyte repletion in 96% of patients. The median time to DKA resolution from insulin initiation was 25.1 (21.0-47.3) hours. Appropriate SC and IV insulin overlap of at least 2 hours was achieved in 47% of patients. Hypokalemia occurred at least once for 52% of patients and hypoglycemia occurred in 39% of patients, however, only 7% were severe events. Patients spent a median of 10.8 (7.31-18.9) hours in the ED and had a median hospital stay of 3.9 (2.7-6.3) days.
**Conclusions:** Adherence to the current institution protocol is minimal. Disparities between our institution’s time to DKA resolution and that of the literature highlights the need for intervention and improvement. Adjustments should be made through development of a new institutional protocol, including electrolyte repletion guidance and optimization of insulin administration, to improve and standardize care for patients diagnosed with DKA across the health system.
Conference Abstracts  
May 16-18, 2022

**Presenter Name:** Majethia, Pari  
**Organization:** University of Maryland Baltimore Washington Medical Center  
**Category:** Emergency Medicine  
**Day | Session | Room | Time:** Tuesday | 4 | Empire C | 3:15:00 PM

**Authors:** P. Majethia, E. Oladele, K. Morrell, S. Pires

**Title:** Treatment of asymptomatic bacteriuria in patients discharge from the emergency department

**Objectives:** A urinalysis is an attractive option to practitioners because it is rapidly available, cost effective, and easy-to-collect in both inpatient and outpatient settings. A study demonstrated that approximately 62% of all admissions to the general medical service had a urinalysis collected, and most patients were asymptomatic. The Infectious Disease Society of America published guidelines in 2019 stating to avoid antibiotic treatment in patients with bacteriuria without urinary symptoms unless the patient is pregnant or undergoing a urologic procedure. Asymptomatic bacteriuria is one of the major contributors of inappropriate antibiotic use resulting in antimicrobial resistance. The aim of this study is to determine if there is a need to implement an antibiotic stewardship program at Baltimore Washington Medical Center (BWMC) prior to discharge from the emergency department (ED) in addition to the current post discharge stewardship. Furthermore, the data from this study might help to evaluate the need for routine urine analysis in patients who are asymptomatic which might impact time to discharge from the ED.

**Methods:** A retrospective cohort of patients discharged from the BWMC ED during February 1, 2021 to August 31, 2021 who had a reflexed urine culture. The primary outcome is the percentage of patients treated with antibiotics who meet criteria for asymptomatic bacteriuria. Secondary outcomes include describing the prescribing patterns associated with treatment of patients who met criteria for asymptomatic bacteriuria and number of patients requiring ED/hospital admission for urinary tract infection or antibiotic side effects within 30 days. We identified 330 patients who were discharged from the BWMC ED with a reflexed urinary culture and screened each patient for inclusion.

**Results:** Of the 330 patients, 105 patients met the inclusion criteria and 62 patients received antibiotics (59%). In comparing the urinalysis, there was a significant difference in leukocyte esterase - large (antibiotics n=38, 61%, no antibiotics n=11, 26%; p <0.0001), white blood cells - >50 (antibiotics n=30, 48%, no antibiotics n=12, 28%; p- 0.04, and nitrites (antibiotics n=14, 23%, no antibiotics n=2, 5%; p- 0.01). Additionally, there was a difference in age between the two groups (antibiotics median age = 62; no antibiotics median age = 46; p- 0.02). Three patients returned to the ED within 30 days for urinary tract symptoms (3%) and 2 of the patients...
were in the antibiotic group. Two patients in the antibiotic group were hospitalized within 30 days for urinary tract infection (2%).

**Conclusions:** Approximately two-thirds of patients with asymptomatic bacteriuria, inappropriately received antibiotics upon discharge from the ED. Based on the results above, factors likely influencing prescribing pattern are urinalysis and age.
Conference Abstracts
May 16-18, 2022

Presenter Name: Miller, Dakota
Organization: Jefferson Abington Hospital
Category: Emergency Medicine
Day | Session | Room | Time: Tuesday | 4 | Empire C | 2:45:00 PM

Authors: Dakota Miller, Pharm.D; Danielle Schulingkamp, RPh, BCPS, BCCCP; Megha Patel, Pharm.D, BCPS

Title: Expedition and Safety of Medication Administration in a Trauma Bay With Pharmacist Participation

Objectives: The purpose of this study was to determine how a pharmacist impacts time to medication administration in an emergency department trauma bay.

Methods: This study included patients 18 years of age and older who presented to the Jefferson Abington Hospital emergency trauma center and received treatment as a level 1 or level 2 trauma. Patients had to receive at least one study medication between November 1, 2021 and February 28, 2022. The medications reviewed in this study included the following: antiepileptics, benzodiazepines, antihypertensives, vasopressors, analgesics, anticoagulant reversal agents, and antimicrobials. The primary outcome was the difference in time from a medication order to medication administration when a pharmacist was present compared to when a pharmacist was absent during trauma resuscitation. Secondary outcomes included the evaluation of the correct use of four-factor prothrombin complex concentrate (4F-PCC) and appropriateness of antibiotic initiation.

Results: A total of 56 patients were analyzed in this study, including 31 patients without pharmacist involvement and 25 patients with a pharmacist present. Average administration times were shorter by two minutes when a pharmacist was part of the treatment team. The largest differences were seen in medications requiring preparation outside of the trauma bay. Furthermore, higher accuracy with dosing and correct use of several medications may be an additional benefit.

Conclusions: Active pharmacist participation in trauma resuscitations leads to faster medication administration times, most noticeably for medications that require preparation outside of the trauma bay. Furthermore, higher accuracy with dosing and correct use of several medications may be an additional benefit.
Mirza, Zaki

Ordering practices of urinalyses and urine cultures and their impact on outpatient antimicrobial prescribing practices in the emergency department

Conference Abstracts
May 16-18, 2022

Presenter Name: Mirza, Zaki
Organization: Hospital of the University of Pennsylvania
Category: Emergency Medicine
Day | Session | Room | Time: Tuesday | 4 | Empire C | 3:30:00 PM

Authors: Zaki Mirza, PharmD; Tiffany Lee, PharmD, BCIDP; Gregory Kelly, PharmD, MS, BCCCP; David Gajdosik, PharmD, BCPS

Title: Ordering practices of urinalyses and urine cultures and their impact on outpatient antimicrobial prescribing practices in the emergency department

Objectives: Current literature suggests that patients are often ordered urinalyses and urine cultures in the emergency department then treated with antibiotics in the absence of urinary symptoms. According to guidelines for asymptomatic bacteriuria, this is only appropriate in specific populations. The objective of this study is to access prescribing practices at a large academic medical center and to highlight the stewardship implications of this practice for patients discharged from the emergency department with an unnecessary prescription for outpatient antibiotics.

Methods: Medical records of adult patients who were discharged from the emergency department between January 2019 and January 2020 and had a urinalysis or urine culture ordered during their stay were reviewed. The primary endpoint is the avoidable number of days of outpatient antimicrobial therapy in patients who do not have a true urinary tract infection. The secondary endpoint is the percentage of urinalyses or urine cultures ordered in patients without signs and/or symptoms of a urinary tract infection. Descriptive statistics were used to evaluate the primary and secondary endpoints.

Results: A random sampling of 250 medical records that met inclusion criteria were evaluated. A total of 140 days of antibiotic therapy were prescribed for 21 patients who did not have a true urinary tract infection. It is estimated that 56.8% of patients reviewed were ordered a urinalysis or urine culture in the absence of signs and/or symptoms of a urinary tract infection. Descriptive statistics were used to evaluate the primary and secondary endpoints.

Conclusions: Results from this study will help to quantify ordering practices of urinalyses and urine cultures based upon symptomatology and guide stewardship efforts in the emergency department. Collaboration between the infectious diseases team and emergency department will help guide and provide tangible evidence regarding the benefits in terms of unnecessary antibiotic use, which has been associated with increased hospitalization costs, reduced susceptibilities, and medication-related adverse events. Identification of chief complaints that lead to appropriate ordering versus inappropriate ordering could lead to an actionable change in order bundles, thus mitigating the likelihood of unnecessary prescribing of antimicrobials.
Evaluating the safety and efficacy of intravenous antihypertensives prior to the administration of alteplase for acute ischemic stroke in a community hospital setting

Presenters: Mott, Renee
Organization: Suburban Hospital Johns Hopkins Medicine
Category: Emergency Medicine
Day | Session | Room | Time: Wednesday | 5 | Empire C | 1:00:00 PM

Authors: R. Mott, U. Ansari; Suburban Hospital/Johns Hopkins Medicine, Bethesda, Maryland

Title: Evaluating the safety and efficacy of intravenous antihypertensives prior to the administration of alteplase for acute ischemic stroke in a community hospital setting

Objectives: Approximately 750,000 people in the United States experience a stroke every year, 87% of which are ischemic strokes. The 2019 American Heart Association/American Stroke Association stroke guidelines recommend 0.9 mg/kg of alteplase for treatment of acute ischemic stroke. A blood pressure of greater than or equal to 185/110 mmHg excludes a patient from receiving alteplase; however, if this is the only exclusion criteria the patient meets, then it is appropriate to lower the blood pressure to less than 185/110 mmHg before administering alteplase. As a certified stroke center, Suburban Hospital/Johns Hopkins Medicine treats approximately 400 stroke patients annually. Given this population of stroke patients, we can evaluate the safety and efficacy of antihypertensive use prior to alteplase administration.

Methods: This retrospective chart review will include patients admitted to Suburban Hospital/Johns Hopkins Medicine from January 1, 2019 through December 31, 2020 who were at least 18 years old and received alteplase for acute ischemic stroke within 3 to 4.5 hours of symptom onset. Patients who received any blood pressure lowering medication other than intravenous (IV) nicardipine, IV labetalol, or IV hydralazine will be excluded. The primary outcome will measure the efficacy of antihypertensive use prior to alteplase administration by evaluating the National Institutes of Health Stroke Scale (NIHSS) score, the frequency of thrombectomy after alteplase administration, and the incidence of death after alteplase administration. The secondary outcome will measure the safety of antihypertensive use prior to alteplase administration by evaluating the following: incidence of intracranial hemorrhage, bleeding, guideline directed alteplase dosing, hypersensitivity reactions, the presence of cerebral edema, cerebral herniation, seizure, new ischemic stroke, or embolism following the administration of alteplase, the length of hospital and ICU stay, and the incidence of mechanical ventilation.

Results: Data collection is currently in progress, and will evaluate the safety and efficacy of IV antihypertensive use prior to alteplase administration by reviewing the primary and secondary endpoints identified.

Conclusions: Findings will be shared with the proper committees to ensure optimal stroke care is being provided to patients based on evidenced-based medicine. Recommendations and
healthcare provider education will be performed based on the findings of this retrospective review.
Impact of a naloxone prescribing guidance document and staff education on naloxone outpatient prescribing in the emergency department

**Authors:** J. Ngo, A. Albright, A. Anderson, R. Woessner

**Title:** Impact of a naloxone prescribing guidance document and staff education on naloxone outpatient prescribing in the emergency department

**Objectives:** Despite the ongoing rise of the opioid crisis, there remains a significant gap between the prescribing of naloxone for patients who are prescribed opioids or are at high risk of experiencing an opioid overdose. National data from the Centers for Disease Control and Prevention reports that from 2012-2016, less than 1% of qualified patients were prescribed naloxone, and emergency department (ED) providers prescribe naloxone at a rate of 2.8 per 100 high-dose opioid prescriptions. The purpose of this study was to (1) identify gaps in naloxone prescribing in the ED at Bon Secours Memorial Regional Medical Center, a 225-bed community hospital, and (2) evaluate the impact of implementing interventions, including provider and nursing education and a naloxone prescribing guidance document, on naloxone prescribing practice in the ED.

**Methods:** From September 2021 to March 2022, medical records of adult ED patients (ages 18 and up) were reviewed if they received an outpatient naloxone prescription and either (1) received an outpatient opioid prescription or (2) had a history of opioid use disorder. Data collection was completed over a six-month period and the following interventions were implemented at the 3-month midpoint: ED provider education using the resident-developed naloxone prescribing guidance document, ED nursing education on key patient counseling points for naloxone, and distribution of patient education brochures on opioid overdose and naloxone in the ED. An ED provider survey was conducted before and after the interventions to identify gaps in naloxone prescribing.

**Results:** The change in the number of naloxone prescriptions per 100 opioid outpatient prescriptions and per 100 patients with an opioid use disorder, before and after the implemented interventions, was recorded, and results will be presented. In addition, the collection of survey responses from ED providers will be discussed.

**Conclusions:** It is anticipated that this project will identify the gaps in naloxone prescribing at a community hospital ED and provide insight on the utility of naloxone-focused interventions at the provider and nursing level to increase appropriate naloxone prescribing.
Evaluation of Management and Outcomes in Patients Treated with Discordant Antibiotics for Cystitis in the Emergency Department

Objectives: Increasing antibiotic resistance limits the choice of antibiotic agents available to treat urinary tract infections (UTI's). When treating urinary infections, studies suggest that urinary antibiotic concentrations may be more predictive of clinical cure than serum concentrations. Clinical Laboratory and Standards Institute (CLSI) breakpoints are typically based on serum concentrations not urinary concentrations. As CLSI breakpoints are based on serum concentrations, the possibility exists that organisms considered “resistant” may be sufficiently killed in the urine with antibiotics achieving high urinary concentrations. The purpose of this study is to measure the incidence of clinical cure among individuals discharged from the emergency department (ED) on antibiotic therapy to which urinary isolates were later found to be resistant (discordant therapy). We predict that patients with cystitis who were empirically treated with discordant antibiotic therapy with high urine concentrations may demonstrate acceptable clinical cure rates.

Methods: To evaluate rates of clinical cure among patients treated with discordant antibiotic therapy, a list of urine cultures collected in the emergency department from January 1, 2015, to December 31, 2020, was evaluated. Patients with a discharge diagnosis of cystitis treated with antibiotic therapy to which urinary isolates were later found to be resistant (discordant therapy) were included. Patients were stratified into two groups based on the urine concentrations of the antibiotic prescribed at discharged. Antibiotics that concentrate well in the urine (this included nitrofurantoin, trimethoprim / sulfamethoxazole, and fluoroquinolones) were placed in one group and those discharged with antibiotics with lesser urine concentration (such as beta lactams) were placed in another group. The primary outcome of clinical cure was defined as resolution of symptoms evaluated via telephone interview. In addition to analysis of the primary outcome, rates of antibiotic therapy modification following ED discharge were also evaluated.

Results: Resolution of symptoms and outcomes discussed will be displayed and results will be presented.
**Conclusions:** It is anticipated that this evaluation will clarify our assessment of resistant antibiotics when treating cystitis at our institution.
Patel, Akta

Evaluation of geriatric patients in the emergency department prescribed potentially inappropriate medications upon discharge

Conference Abstracts
May 16-18, 2022

Presenter Name: Patel, Akta
Organization: Pennsylvania Hospital, Philadelphia, Pennsylvania
Category: Emergency Medicine
Day | Session | Room | Time: Monday | 2 | Empire D | 3:00:00 PM

Authors: Akta Patel, Marc Crane

Title: Evaluation of geriatric patients in the emergency department prescribed potentially inappropriate medications upon discharge

Objectives: In the United States, it has been approximated that 75 million people will be over the age of 65 by the year 2030. Data shows that geriatric patients have increased admission rates, prescription of potentially inappropriate medications (defined by the Beers Criteria), and frequent re-visits to the emergency department (ED). However, patients in this cohort continue to utilize the ED more frequently than their non-geriatric counterparts, possibly because it serves as an accessible point of care. In anticipation of this population surge, the Geriatric Emergency Department Association (GEDA) provides guidance to the faculty in the emergency department to improve the setting, culture, and education for geriatric patients. To improve care for this increasing clinically complex population, analysis of the association between potentially inappropriate medications upon discharge, ED revisits, and hospital admissions will provide local data to recognize areas of improvement and advance geriatric certification at Pennsylvania Hospital per GEDA guidelines.

Methods: This retrospective, single-center, observational study characterized 200 geriatric patients treated at the emergency department at PAH from July 2020 to July 2021. Patients greater than or equal to the age of 65 were stratified according to the prescription of potentially inappropriate medications versus no potentially inappropriate medications upon discharge from the emergency department. De-identified data was compiled in a secure REDCap Cloud database.

Results: The correlation between potentially inappropriate medications and revisits to the emergency department will be recorded, and the results will be presented.

Conclusions: It is anticipated that this project will demonstrate the prescription patterns of potentially inappropriate medications and contribute to identifying areas of improvement in the emergency department when caring for the geriatric patient population.
**Title:** Safety and efficacy of parenteral ketorolac doses less than or equal to 15mg intravenous or 30mg intramuscular versus 30mg intravenous or 60mg intramuscular in emergency department patients 65 years and older

**Objectives:** Previous studies have suggested that ketorolac demonstrates an analgesic ceiling effect where higher doses greater than 10 to 15 mg may not provide additional benefit; however, these studies excluded patients 65 years and older. Therefore, the purpose of this study is to evaluate the analgesic efficacy and safety of parenteral ketorolac doses less than or equal to 15mg IV or 30mg IM compared to doses greater than 30mg IV or 60mg IM in emergency department (ED) patients 65 years and older.

**Methods:** This is an Institutional Review Board (IRB) approved retrospective chart review conducted using electronic medical record (EMR) data from ED patients 65 years and older who received at least one dose of parenteral ketorolac. Patients were separated into two cohorts based on the ketorolac dose received. The primary objective was to evaluate the analgesic efficacy of parenteral ketorolac doses ≤ 15mg IV or 30mg IM versus doses > 30mg IV or 60mg IM measured as a need for rescue analgesia 30 minutes to 2 hours after ketorolac administration. Secondary objectives included assessing the change in pain scores and occurrence of adverse drug events commonly associated with ketorolac use in elderly patients.

**Results:** A total of 312 patients were included in the study: 52 patients received ketorolac doses ≥ 30mg IV or 60mg IM and 260 patients received ketorolac doses ≤ 15mg IV or 30mg IM resulting in a 1:5 ratio between comparator groups. Need for rescue analgesia occurred in 24 (7.7%) patients overall with a greater frequency in the group who received ketorolac doses > 30mg IV or 60mg IM (n=7; 13.5%) compared to those who received ketorolac doses ≤ 15mg IV or 30mg IM (n=17; 6.6%). The most common rescue medication utilized was lidocaine-menthol patches (25.0%) followed by IV morphine (20.8%) and oral oxycodone-acetaminophen (12.5%). Pain scores at baseline, after ketorolac administration, and following rescue analgesia are being collected to assess for changes indicative of analgesia efficacy. Incidence of adverse events commonly associated with ketorolac including gastrointestinal bleeding, acute kidney injury, edema, cardiovascular thrombotic events, and deleterious central nervous system effects are also being quantified. Final results surrounding changes in pain scores and occurrence of adverse events are in process and will be provided in the final presentation.
Conclusions: Ketorolac doses > 30mg IV or 60mg IM in patients 65 years and older did not result in less need for rescue analgesia supporting the theory that an analgesic ceiling effect exists. Physiological, age-related changes, comorbidities, and polypharmacy increase the potential for adverse drug events in elderly patients. Additionally, side effects associated with ketorolac are often dose dependent. For these reasons, the recommended dosing for patients 65 years and older is ≤ 15mg IV or 30mg IM; however, this was determined based on safety rather than efficacy. The findings from this study lend to the growing support that ketorolac at doses ≤ 15mg IV or 30mg IM provide a sufficient analgesic effect affording providers greater confidence in efficacy when prescribing the recommended doses.
Implementation of a sustainable naloxone distribution program to non-clinical areas of a large academic medical center

**Objective:** Johns Hopkins Hospital is looking for opportunities to expand access for naloxone use in non-clinical areas across the academic and medical buildings on the East Baltimore campus. This required the establishment a process that allows for rapid access to naloxone nasal spray and replenishment of these doses to in the event of an opioid overdose emergency. The purpose of this project is to create a sustainable program to allow for the training and distribution of naloxone to the high traffic non-clinical areas within the Johns Hopkins Hospital.

**Methods:** The initiative was completed by a workgroup comprised of clinical pharmacists, pharmacy administrators, and Department of Public Safety administrators. This collaboration allowed for establishment of our hospital as an Overdose Response Program (ORP) and the development and implementation of departmental standard operating procedures and a hospital wide policy. Naloxone nasal spray supply obtained through the Maryland ORP was distributed through the hospital's inpatient Central Pharmacy. The training software, "PowerDMS", was utilized to implement annual training to be provided to all Johns Hopkins Public Safety officers. Pre- and post-training surveys were included in the software to ensure that goals of training are met. Data collected provides feedback to allow for improvement and update of naloxone training. Installation of Overdose Emergency Kits in high traffic non-clinical areas across the academic and medical campus allows for the use of naloxone nasal spray by the public safety officers in the event of a suspected opioid overdose. Replenishment of used doses or doses nearing expiration is facilitated by the Departments of Pharmacy and Public Safety on a monthly basis.

**Results:** Results to be presented.

**Conclusions:** The implementation of a naloxone nasal spray distribution program created a sustainable process for public safety officers to have training and access to naloxone nasal spray in high traffic non-clinical areas of a large academic medical center in the event of a suspected opioid overdose.
Pharmacist review of discharge antibiotic prescriptions in the emergency department

**Objectives:** Antibiotics are prescribed for over 13% of emergency department (ED) patients with at least one-third of these prescribed inappropriately. The Centers for Disease Control and Prevention recognizes inappropriate antibiotic prescribing as the most important modifiable risk factor for antibiotic resistance. In addition, inappropriate antibiotic prescribing contributes to Clostridioides difficile infections, treatment failure, adverse effects, and increased hospital cost and length of stay. Pharmacist review of medications at time of discharge from the ED leads to a reduction in inappropriate prescribing and increases patient safety. The aim of this quality improvement (QI) project is to implement pharmacist-led antimicrobial stewardship interventions in the ED to reduce the rate of discharge medication errors by 25% by May 2022.

**Methods:** This QI project includes adult patients discharged from the ED with an electronic prescription for select antibiotics indicated for urinary tract infections (UTI). Patients discharged from the pediatric ED, receiving antibiotics for other indications, and receiving paper prescriptions were excluded. The Institute for Healthcare Improvement Model was utilized. Changes were tested through Plan-Do-Study-Act cycles. A UTI treatment algorithm and dosing table was created for assessment of therapy appropriateness. Based on local resistance patterns, a change to a one-time gentamicin dose was recommended for the initial outpatient treatment of pyelonephritis. Education regarding changes in practice was provided to the ED providers and pharmacists. Default doses and durations of antibiotics were updated in the electronic health record for ordering optimization. The outcome metric was a composite of percent medication errors, which included medication, dose, frequency, and duration inappropriateness. Process metrics were the individual components of the composite endpoint and the number of gentamicin doses. The balancing metric was percent of new Clostridioides difficile infections diagnosed.

**Results:** Baseline data collected from January 1, 2021 to December 31, 2021 (n=188) suggest that 63% of antibiotic prescriptions for UTIs contain errors. The percentage of medication errors following the interventions will be presented.
**Conclusions:** While conclusions cannot be drawn at this stage, it is anticipated that pharmacist review of select discharge antibiotic prescriptions will lead to a reduction in percentage of medication errors.
Comparison of a Severity of Ethanol Withdrawal Scale guided phenobarbital protocol with a Clinical Institute Withdrawal Assessment guided lorazepam protocol on the duration of alcohol withdrawal treatment

**Objective:**

Using a symptom-triggered benzodiazepine treatment protocol such as the Clinical Institute Withdrawal Assessment (CIWA) protocol for alcohol withdrawal syndrome is well established, but there are many benefits to using phenobarbital as well. Phenobarbital has been proposed as an alternative agent for use in alcohol withdrawal syndrome, but there is a lack of evidence supporting a specific administration protocol for this agent. In this study we compared patients with alcohol withdrawal syndrome who were treated with either CIWA guided lorazepam or Severity of Ethanol Withdrawal Scale (SEWS) guided phenobarbital protocols to evaluate the impact on total length of withdrawal treatment.

**Methods:**

A retrospective chart review was conducted of adult patients who were treated with either SEWS/phenobarbital protocol or CIWA/orazepam protocol for alcohol withdrawal syndrome from September 1st, 2019 to August 30th, 2021. Patients were included if their alcohol withdrawal symptoms were classified as mild, moderate, or severe on either scale and they received at least three administrations of either agent. Exclusion criteria included pregnancy, being on a phenobarbital or benzodiazepine regimen prior to admission, receiving either agent for a non-alcohol withdrawal indication, being placed on a ventilator, diagnosis of Wernicke's encephalopathy, mortality from another cause, or a CIWA score of 1-7. The primary outcome was average length of treatment for alcohol withdrawal syndrome, with amount of phenobarbital equivalents used while inpatient as a secondary outcome.

**Results:**

The median length of treatment for alcohol withdrawal syndrome was significantly shorter with SEWS/phenobarbital (1651 min [IQR; 945-2440]) than treatment with CIWA/orazepam (4108 min [IQR; 2408-6045], p<0.001). The median amount of phenobarbital equivalents (PE) used while inpatient was significantly less in the CIWA/orazepam group (457.5 PE [IQR; 225-870]) than in the SEWS/phenobarbital group (1260 [IQR; 705-1750], p<0.001).

**Conclusions:**

Patients treated with a SEWS/phenobarbital protocol may require a shorter duration of treatment for alcohol withdrawal syndrome than those treated with a CIWA/orazepam protocol but additionally may require higher doses of phenobarbital.
equivalents while inpatient. These findings support further investigation and application of a SEWS/phenobarbital for the treatment of alcohol withdrawal syndrome.
Presenter Name: Scott, Savanna  
Organization: Riverside Regional Medical Center  
Category: Emergency Medicine  
Day | Session | Room | Time: Wednesday | 6 | Empire A | 3:30:00 PM

Authors: Savanna Scott, PharmD and Tanya Claiborne, PharmD

Title: Decreasing emergency department readmission and length of stay by developing a venous thromboembolism and superficial venous thrombosis treatment protocol

Objectives: This project will determine whether a protocol with risk stratification and defined follow-up, for the management of superficial venous thrombosis (SVT) and VTE, is associated with shortened Emergency Department length of stay and decreased readmission rates of subsequent VTE and SVT. The purpose of this study is to design and evaluate a protocol used for the identification and treatment of patients presenting to the ED with VTE and SVT who are appropriate for outpatient treatment.

Methods: This is a single-center cohort study, conducted at a level II trauma center which includes patients diagnosed with VTE or SVT, pre and post implementation of an outpatient VTE and SVT treatment protocol utilizing both nursing and pharmacy interventions. Nursing interventions include educating patients on anticoagulation therapy and documentation of education. Pharmacist interventions include providing training to residents working in the ED, protocol development for VTE and SVT treatment guidance, and discharge education development. The patient population includes patients diagnosed with VTE or SVT before and after protocol implementation. The primary outcome to be examined is ED length of stay. Secondary endpoints to be examined include the proportion of patients selected for outpatient treatment, ED readmission for VTE and SVT, number of patients treated outpatient, the percentage of patients that receive a first dose of anticoagulation in the ED. A survey assessing comfort and knowledge of outpatient VTE and SVT treatment was distributed to emergency department physicians before and after education.

Results: The primary outcome of ED length of stay and secondary endpoints including the proportion of patients selected for outpatient treatment, ED readmission for VTE and SVT, number of patients treated outpatient, and the percentage of patients that receive a first dose of anticoagulation in the ED will be recorded and results will be presented.

Conclusions: It is anticipated that this project will demonstrate the importance of institutional protocol development in a community emergency department to decrease ED length of stay and increase the proportion of patients selected for outpatient treatment of VTE and SVT.
Evaluation of a redesigned refractory alcohol withdrawal protocol utilizing phenobarbital and dexmedetomidine and its impact on reducing the need for higher level care admissions

**Authors:** K. Seabrook, S. Troob, A. ZuWallack; Kent Hospital, Warwick, Rhode Island

**Title:** Evaluation of a redesigned refractory alcohol withdrawal protocol utilizing phenobarbital and dexmedetomidine and its impact on reducing the need for higher level care admissions

**Objectives:** The standard of care for alcohol withdrawal syndrome continues to be benzodiazepines; however, many patients experience benzodiazepine-refractory alcohol withdrawal, often requiring adjunct medications and intensive care unit admission. A redesigned alcohol withdrawal protocol was implemented to reduce higher level care admissions. This protocol, meant for severe, benzodiazepine-refractory alcohol withdrawal, includes front-loaded intravenous phenobarbital and adjunct dexmedetomidine, with the goal of initiating early in the emergency department. Studies have shown these medications reduce intensive care unit admissions and length-of-stay. The purpose of this study is to evaluate the efficacy and safety of this redesigned protocol compared with the previous one.

**Methods:** This single-center, retrospective cohort study was completed at a 359-bed community teaching hospital in Warwick, Rhode Island and was designed to compare patients who received the previous alcohol withdrawal protocol to patients who received the redesigned protocol. Education of nursing, providers, and pharmacy staff was required before initiation of this protocol. Pre-implementation data was collected via chart review of patients who received the previous protocol and post-implementation data is being collected on patients who received the redesigned protocol between December 20th, 2021 and January 20th, 2022. The primary outcome is the number of intensive care unit admissions using the redesigned protocol versus the previous one. Secondary outcomes include the number of step-down unit admissions and medical-surgical unit admissions; maximum clinical institute withdrawal assessment alcohol scale revised (CIWA-Ar) scores within twenty-four hours; intubation status (and reason for intubation, if applicable); and reason for discontinuation of dexmedetomidine, if applicable, to determine medication safety.

**Results:** The pre-implementation group included ninety-four patients, of which 11.7% were admitted to the ICU. Admission to the step-down unit made up 2% of the group and medical-surgical unit admissions accounted for 62.8%. The range for maximum CIWA-Ar score within 24 hours was <9 in 41.5%, 9-14 in 28.7%, 15-20 in 18.1%, 21-30 in 9.6%, and >30 in 2% of patients. Of this group, 4.3% were intubated during hospitalization; however, none of these were
due to alcohol withdrawal. Post-implementation data collection is still being completed and final results will be presented.

**Conclusions:** It is anticipated that this project will demonstrate the utility of intravenous phenobarbital and adjunct dexmedetomidine in patients with severe, refractory alcohol withdrawal with the hopes of reducing the need for higher level of care.
The Efficacy of Thrombectomy Alone versus Alteplase Alone and Combined Therapy: A Retrospective Cohort Study

Objectives: This research project will explore the efficacy of thrombectomy alone compared to alteplase alone and combination therapy in acute ischemic stroke (AIS) patients treated at TidalHealth Peninsula Regional from May 2019 to October 2021.

Methods: This study is designed as a retrospective cohort study that includes all patients admitted to TidalHealth Peninsula Regional for treatment of AIS from May 2019 to October 2021. All data will be collected through retrospective chart review. Information collected will include patient age, sex, weight, race, NIHSS upon presentation and at discharge, mRS at discharge and 90 days post discharge, and time from onset to alteplase and thrombectomy therapy. Exclusion criteria include patients who are deemed to have “wake up strokes,” received incomplete thrombectomy or alteplase administration, patients with disability prior to admission, defined as mRS greater than 2 at baseline. The primary outcomes will be NIHSS score at discharge and change in NIHSS score from admission to discharge. Secondary outcomes include modified Rankin score (mRS) at discharge, incidence of hemorrhage, and other major adverse events including new embolism, vasospasm, and angioedema associated with alteplase administration.

Results: 140 Total patients were included in the study. 118 were included from the alteplase alone group, 12 from the combination therapy group, and 10 from the thrombectomy alone group. Baseline characteristics were roughly similar between the groups in terms of weight, gender distribution, and age. Initial NIHSS score had a large difference between groups. Patients in the alteplase group had an average NIHSS score of 11.34 upon initial evaluation compared to 18.68 and 18.33 in the combination and thrombectomy alone groups, respectively. Patients in the alteplase alone group had a higher change from initial NIHSS score of -6.64 compared to -4.18 and -4.13 in the combination group and thrombectomy group, respectively.

Conclusions: Based on the small data set for these groups results were similar at baseline other than initial NIHSS score. Change in NIHSS score was also higher in the alteplase alone group compared to the other groups. Due to the small sample sizes of the thrombectomy alone and combination therapy groups, the results were not truly comparable. While no correlation can be determined, observationally patients who received alteplase alone as compared to other
therapies had less severe initial stroke. Alteplase did have a decrease in NIHSS score from initial analysis to discharge of -6.64 in agreement with other studies showing its benefit. Unfortunately mRS could not be adequately assessed as first intended with this project due to inconsistent collection and documentation. mRS is the main outcome analyzed by previous AIS studies. NIHSS scores can be predictive of mortality in AIS however they do not capture this data as well as mRS which have a set value of 0 for death. Moving forward the process and need for collecting NIHSS scores at baseline as well as 90 day follow up mRS at this institution is a potential area of improvement.
Conference Abstracts
May 16-18, 2022

Presenter Name: So, Natalie
Organization: MedStar Montgomery Medical Center
Category: Emergency Medicine
Day | Session | Room | Time: Tuesday | 3 | Wild Rose A | 1:15:00 PM

Authors: N. So, R. Reese-Leftridge, C. Hoffman; MedStar Montgomery Medical Center, Olney, Maryland

Title: Evaluation of fixed-dose versus body surface area-based leucovorin dosing in patients with colorectal cancer within a large health system

Objectives: A common chemotherapy regimen used in the treatment of colorectal cancer, which is the fourth most common cancer diagnosed in the United States, is FOLFOX (folinic acid, or leucovorin, fluorouracil, and oxaliplatin). As a result of leucovorin shortage, MedStar Franklin Square Medical Center (FSMC) has been using a fixed-dose leucovorin (700 mg) in colorectal cancer patients receiving FOLFOX for at least the past three years, while other sites within the system have continued to use the standard body surface area (BSA)-based leucovorin dosing (400 mg/m²). The primary objective of this study is to evaluate the effect of fixed-dose versus BSA-based leucovorin dosing on overall survival in patients with colorectal cancer within a large health system and the secondary objective is to assess the financial impact of the fixed-dose leucovorin dosing strategy.

Methods: This study is a retrospective chart review of patients who received leucovorin from January 1st, 2018 to March 30th, 2022 at FSMC and MedStar Georgetown University Hospital (GUH). Inclusion criteria include adult patients with a diagnosis of colorectal cancer with written informed consent; treatment naïve patients who received FOLFOX entirely on an outpatient bases with first cycle leucovorin given either as a flat dose (700 mg) at FSMC or BSA-based (400 mg/m²) at GUH. Exclusion criteria include previous therapy for colorectal cancer; patient who received an initial leucovorin dose other than 700 mg or 400 mg/m² on their first cycle; patients with pancreatic cancer; brain metastases; no documented informed consent. Descriptive statistics will be used to interpret the results.

Results: Treatment outcomes such as overall survival and the financial impact between the two dosing strategies will be assessed and results will be presented.

Conclusions: It is anticipated that this project will demonstrate that the two leucovorin dosing strategies will have no differences in the overall survival of patients with colorectal cancer. Furthermore, it is anticipated that the fixed-dose leucovorin strategy will be more cost effective.
Conference Abstracts  
May 16-18, 2022

Presenter Name: Streets, Alexis  
Organization: Sibley Memorial Hospital- Johns Hopkins Medicine  
Category: Emergency Medicine  
Day | Session | Room | Time: Wednesday | 6 | Empire A | 4:00:00 PM

Authors: A. Streets, B. Miles, V. Zhu, K. Anderson-Carroll; Sibley Memorial Hospital- Johns Hopkins Medicine

Title: Evaluation of early antibiotic administration and clinical outcomes of septic patients in the emergency department at a community hospital using rapid-cycle improvement methodology

Objectives: Sepsis is a life-threatening condition characterized by organ dysfunction caused by a dysregulated host response to community-acquired or healthcare-associated infections. Every hour an antibiotic is delayed in a septic patient, the rate of mortality increases by 7.6%; therefore, the Surviving Sepsis Campaign guidelines recommend the administration of antibiotics within one hour of symptom recognition. This study was designed to analyze the current workflow process within the emergency department (ED) at Sibley Memorial Hospital to identify areas of improvement with regards to timely recognition of symptoms and antibiotic administration in septic patients.

Methods: Within this community hospital setting, the Plan-Do-Study-Act (PDSA) rapid-cycle quality improvement (QI) strategy allows adequate time to evaluate, implement, and measure the interventions made to enhance workflow efficiency and improve patient outcomes. A baseline audit was conducted to identify the areas where interventions would be the most impactful. Upon completion of the audit, two PDSA cycles were performed over a period of three months starting with an educational outreach in February 2022, followed by technological interventions and implementation including push-dose antibiotic administration and STAT IV label printers in March 2022.

Results: The time to antibiotic administration after sepsis identification and the empiric antibiotic agent of choice are audited at the end of each month, and results will be compiled and presented.

Conclusions: It is anticipated that the interventions made for this project will lead to a more efficient workflow process by decreasing the time to antibiotic administration and improving the empiric antibiotic selected. These interventions can, in turn, lead to improved patient outcomes including reduced mortality rates, decreased length of hospitalization and increased use of standardized order sets at Sibley Memorial Hospital.
Evaluation of efficacy and safety of four-factor prothrombin complex concentrate for the reversal of rivaroxaban-and-apixaban-associated major bleeding

Objectives: Previous studies have shown that four-factor prothrombin complex concentrate (4F-PCC) is an appropriate off-label agent for the reversal of rivaroxaban-and-apixaban-associated bleeding. However, there is limited evidence evaluating the impact of specific dosing of four-factor prothrombin complex concentrate for apixaban or rivaroxaban reversal. Currently, at Lankenau Medical Center, four-factor prothrombin complex concentrate dosing recommendations are 25-50 units/kg for apixaban or rivaroxaban regardless of indication. This study evaluates whether the current dosing recommendations at Lankenau Medical Center demonstrates similar efficacy and safety outcomes documented in the literature.

Methods: This is a retrospective, single-center, chart review of rivaroxaban-and-apixaban-associated major bleed between March 2018 and August 2021. Major bleeding is defined as intracranial hemorrhage (ICH), gastrointestinal bleeding (GIB), and severe trauma-associated bleeding. The primary outcomes include provider-defined hemostasis and thrombotic events during the hospital stay. The secondary outcomes include evaluation of the reversal specific dosing and outcomes for different factor Xa inhibitors, mortality within 30 days, and the cost of four-factor prothrombin complex concentrate.

Results: A total of 93 patient had a rivaroxaban-or-apixaban-associated major bleed. Provider-defined hemostasis occurred in 79 out of 93 patients (84.95%). Thromboembolic events occurred in 2 out of 93 patients (2.15%). 4F-PCC dose was further broken down into three categories including dose less than 30 units/kg (category 1), dose between 30 to 45 units/kg (category 2), and dose more than 45 units/kg (category 3). Provider-defined hemostasis was observed in 91.7%, 92.3%, and 82.1% in category 1, 2, and 3, respectively. There is no difference between the three categories in thromboembolism within 30 days. 30-day mortality occurred in 6.5% (6/93) of patients in category 1, 3.2% (3/93) of patients in category 2, and 12.9% (12/93) of patients in category 3.

Conclusions: At Lankenau Medical Center, physicians prescribe a dose of 4F-PCC based on the severity of the bleed. We observed similar physician-defined hemostasis with different dosing of 4F-PCC, while thromboembolic events were not significantly different between the
dose ranges. Overall, this result suggests that a fix-dose of 4F-PCC can be an appropriate option for rivaroxaban-and-apixaban-associated major bleeding.
A retrospective review of intramuscular olanzapine or haloperidol and parenteral benzodiazepine administration in the emergency department

**Presenter Name:** Trac, Cindy  
**Organization:** NewYork-Presbyterian Brooklyn Methodist Hospital, Brooklyn, NY  
**Category:** Emergency Medicine  
**Day | Session | Room | Time:** Tuesday | 3 | Empire D | 1:00:00 PM

**Authors:** Cindy K. Trac, PharmD; Kay Takamura, PharmD, BCPS, BCPP; Jessica Laub, PharmD; Cierra Treu, PharmD, BCCCP; Christopher Mendoza, MD, FACEP; Fabienne L. Vastey, PharmD, BCPS

**Title:** A retrospective review of intramuscular olanzapine or haloperidol and parenteral benzodiazepine administration in the emergency department

**Objectives:** Parenteral antipsychotics and benzodiazepines are often co-administered to patients experiencing acute agitation in the emergency department (ED) when de-escalation tactics fail. However, these combinations may be associated with increased risks. Case reports detail cardiorespiratory depression events following the co-administration of intramuscular (IM) olanzapine and parenteral benzodiazepines within 2 hours. In contrast, there is less evidence for cardiorespiratory depression following the co-administration of IM haloperidol and parenteral benzodiazepines. Our study seeks to compare this incidence in patients receiving IM olanzapine or haloperidol in combination with parenteral benzodiazepines.

**Methods:** This was a retrospective cohort study of ED visits from February 2016 to February 2021. Patients 18 years of age and older who were administered IM olanzapine and a parenteral benzodiazepine within 2 hours were identified and compared to an equal number of patients who received IM haloperidol and a parenteral benzodiazepine within 2 hours. The composite primary endpoint assessed the occurrence of cardiorespiratory compromise and included episodes of hypoxia, hypotension, bradycardia, bradypnea, and cardiac arrest within 2 hours. Secondary endpoints included cardiorespiratory compromise within 30 minutes and desaturation or cardiac arrest outside the 2-hour window.

**Results:** One hundred and twelve patients who received IM haloperidol with a parenteral benzodiazepine were randomly selected to equal the sample size of the olanzapine arm. Statistical analyses comparing demographics, cardiorespiratory endpoints, and factors associated with increased risk of cardiorespiratory compromise between both arms will be reported and presented.

**Conclusions:** The results of this study will contribute to available literature regarding concomitant use of intramuscular antipsychotics and parenteral benzodiazepines for acute agitation in the emergency department.
Objectives: Push-dose vasopressors have been increasingly used for the management of peri-intubation hypotension in the emergency department (ED). Previous literature has evaluated the use of phenylephrine and ephedrine as push-dose vasopressors, most frequently in anesthesia literature; however, there is currently limited published information evaluating the use of push-dose epinephrine (PDE) in the ED. The purpose of this study was to describe the effect of PDE on peri-intubation hypotension.

Methods: Data was prospectively collected and retrospectively analyzed from October 8, 2021, through March 31, 2022. Patients at least 18 years of age undergoing intubation in the ED with a systolic blood pressure (SBP) less than 90 mmHg and who received at least one dose of PDE during the period of 30 minutes before and after intubation were included. The primary outcome was change in hemodynamics such as SBP, diastolic blood pressure (DBP), heart rate (HR), and mean arterial pressure (MAP). Secondary outcomes were dose and number of doses of PDE administered, initiation of continuous vasopressor infusion, and adverse events i.e. hypertension (SBP > 180 mmHg), tachycardia (HR > 140 bpm), dysrhythmia, ischemic events, and extravasation. Statistical analysis included a paired t-test or Wilcoxon rank test as appropriate based on distribution of the data for the primary outcome and descriptive statistics (e.g., mean ± standard deviation) for secondary outcomes.

Results: Preliminary results include a total of nine patients who received PDE, and seven patients were analyzed with complete data. Seventy-one percent of patients received more than one dose of PDE, with 20 mcg being the most common dose administered. Following PDE administration, the mean increase in SBP was 20.6 mmHg (SD Å± 10) and the mean increase in MAP was 17.7 mmHg (SD Å± 11.6). A drop in HR was observed following administration of PDE, with a mean decrease of -6.7 bpm (SD Å± 19). All patients except one were initiated on continuous vasopressor infusion with norepinephrine following intubation. There was one episode of tachycardia following administration of PDE.
Conclusions: Based on the interim analysis, the use of PDE during the peri-intubation period was associated with an improvement in hemodynamics, without high rates of adverse effects. The results of this study may have the potential to promote the use of PDE in the ED.
Conference Abstracts
May 16-18, 2022

Presenter Name: Yeh, Ashley
Organization: Robert Wood Johnson University Hospital
Category: Emergency Medicine
Day | Session | Room | Time: Poster

Authors: Ashley Yeh, Sana Mohayya, Jonathan McCoy, Rachel Asaeda, Marc Sturgill, Joseph Barone, Gregory Kelly, Navaneeth Narayanan

Title: Social and demographic determinants of empiric treatment of sexually transmitted infection among emergency department patients

Objectives: Gonorrhea and chlamydia are amongst the most common sexually transmitted infections (STI) in the United States. With increasing numbers of visits to the emergency department (ED) that include an STI diagnosis, ED physicians play an important role in diagnosing and managing STIs and in improving health care outcomes for both patients and their partners. Studies have shown that factors such as race, gender, likelihood of follow-up, and socioeconomic status are associated with how likely patients are to be treated for a STI in the ED. The layer of race often structures how groups of people face different access to resources, opportunities, and risks, making it a fundamental cause of health disparities. It is important for clinicians to recognize these disparities when treating STIs and distinguish areas to improve. The primary objective of the study is to evaluate whether race and/or ethnicity is associated with the initiation of empiric antibiotic treatment for STIs in patients tested for gonorrhea and chlamydia and discharged from the ED.

Methods: This single-center, retrospective, cohort study has been approved by the IRB. Patients were included if they were ≥18 years old, tested for gonorrhea and chlamydia using a Cobas CT/NG Assay nucleic acid amplification test (NAAT), and discharged from the ED between January 1, 2019 to December 31, 2019. Patients were identified based on a consecutive convenience sample of first episode per patient per this study period. De-identified data collected include patient demographics, insurance status, documented primary care physician, primary diagnosis, and history of previous STI treatment, if available. Specific STI treatment medications administered and gonorrhea/chlamydia test results were also collected.

Results: Baseline characteristics will be collected. The number and percentage of patients treated and not treated based on race/ethnicity will be recorded and results will be presented. Regression modeling will be used to control for confounding variables.

Conclusions: It is anticipated that this project will identify and characterize patient specific factors that influence STI treatment patterns in the ED in order to recognize disparities in empiric STI treatment and distinguish areas to improve practice and provide more equitable care.
Safety and Efficacy Following Alteplase Administration in a Mobile Stroke Unit

Objectives: Clinical outcomes for patients presenting with acute ischemic stroke are optimized when treated as soon as possible following the onset of symptoms. Thus, time from pre-hospital alert to hospital arrival becomes a critical determinant in patient care. Incorporation of a mobile stroke unit (MSU) has the potential to reduce time from last known normal (LKN) to alteplase administration. The MSU at our institution is equipped with a computerized tomography (CT) scanner, point of care testing, and a specialized care team in order to facilitate timely administration of alteplase. The purpose of this study is to determine safety and efficacy following alteplase administration in the MSU.

Methods: A retrospective chart analysis was conducted at a single-site evaluating all MSU admissions within the past five years. Patients were included in the study if they received alteplase in the MSU prior to hospital arrival. The primary efficacy endpoint in this analysis was the National Institute of Health Stroke Scale (NIHSS) at 24 hours and 90 day modified Rankin Scale (mRS) after alteplase administration. Secondary endpoint evaluated percentage of patients with an NIHSS score <10 at 24 hours and change in NIHSS scores over the 24-hour time period. Additional secondary endpoints were time metrics from last known normal, MSU activation, alteplase administration, and thrombectomy. Primary safety analysis will look at percentage of patients who develop intracranial hemorrhage on CT scan within 24 hours following alteplase administration.

Results: A total of 83 patients were eligible for inclusion in the study. Average age of participants was 67.8 (+ 15.9) years. In regards to the primary endpoint, median NIHSS score at 24 hours was 2 (IQR 0-8). Approximately 79.5% of patients had an NIHSS score < 10 at 24 hours with an average reduction in NIHSS over the 24-hour period of 4.5 (SD 6.1). The median time from LKN to alteplase bolus was 102 minutes (IQR 83-131) and from MSU arrival/contact to alteplase bolus was 51 minutes (IQR 43-58). In review of the safety analysis, 13 (15.7%) patients developed hemorrhage on 24-hour CT.

Conclusions: Incorporation of a mobile stroke unit may provide timely administration of thrombolytic agents in patients experiencing stroke symptoms with similar efficacy outcomes to those receiving thrombolytic in emergency department. Rates of intracranial hemorrhage were higher in patients with high NIH scores.
Conference Abstracts
May 16-18, 2022

Presenter Name: Zou, Xiaoxu
Organization: NewYork-Presbyterian Brooklyn Methodist Hospital
Category: Emergency Medicine
Day | Session | Room | Time: Tuesday | 4 | Empire C | 3:00:00 PM

Authors: Xiaoxu Zou; Cierra N. Treu; Jessica Laub; Christopher Mendoza

Title: Evaluation of change in blood glucose over time with regular insulin versus rapid acting insulin for treatment of hyperglycemia in the emergency department

Objectives: Both regular and rapid acting insulin can be used to effectively treat hyperglycemia in an acute setting, but rapid acting insulins have a faster onset of action and peak compared to regular insulin. The purpose of this study is to compare the blood glucose reduction over time in hyperglycemic patients receiving subcutaneous regular insulin versus rapid acting insulin in the Emergency Department (ED).

Methods: This was a retrospective chart review from January 1st, 2018 to December 31st, 2020 that included ED patients 18 years of age or older with an initial blood glucose ≥200 mg/dL who received subcutaneous regular insulin or insulin aspart. Patients were excluded if they required inpatient admission, were diagnosed with diabetic ketoacidosis or hyperosmolar hyperglycemic syndrome, were maintained on an insulin pump, or were treated with intravenous (IV) insulin, long acting insulin, or oral anti-hyperglycemic agents. The primary endpoint was the change in blood glucose immediately before and ≥30 minutes after insulin administration divided by time. The secondary endpoints included incidence of hypoglycemia, total change in blood glucose during visit, volume of IV fluids received, additional doses of insulin received, weight-based dosing for first insulin dose, ED length of stay (LOS), and time from insulin administration to discharge. All data collected through electronic medical records were entered into REDCap de-identified. A Chi-Square analysis was used to compare nominal data and a t-test analysis was used for comparison of all continuous variables.

Results: A total of 279 patients were included in the study, 108 in the regular insulin group and 171 in the insulin aspart group. There was no significant difference in baseline demographic between the two groups. The change in blood glucose over time was 48.2 mg/dL/hour in patients who received regular insulin and 52.2 mg/dL/hour in patients who received insulin aspart (p-value = 0.32). There was no difference in incidence of hypoglycemia, ED LOS, time from insulin administration to discharge, and total change in blood glucose over the course of ED stay. More patients who received insulin aspart received additional doses of insulin (18.1% vs 8.3%, p-value = 0.02). Patients who received insulin aspart received less volume of IV fluids (1280 mL vs 1629 mL, p-value = 0.004) and lower weight-based dose for first insulin dose (0.10 units/kg vs 0.11 units/kg, p-value = 0.03).
Conclusions: There was no significant difference in blood glucose reduction between regular insulin and insulin aspart for hyperglycemic patients who were treated in the ED. This retrospective review suggests that regular insulin and rapid acting insulin can be administered for the treatment of acute hyperglycemia in the ED. Future studies are needed to confirm these findings and assess the role of IV fluids in blood glucose reduction in conjunction with subcutaneous insulin therapy.
Presenter Name: Bangrazi, Alyssa  
Organization: Wentworth-Douglass Hospital  
Category: General Clinical Practice  
Day | Session | Room | Time: Monday | 1 | Empire D | 12:45:00 PM

Authors: Alyssa Bangrazi, Tonya Carlton, Katherine Collopy

Title: Comparison of phenobarbital versus benzodiazepines for the management of patients at high risk of alcohol withdrawal in a community hospital setting

Objectives: Benzodiazepines are recommended as first line therapy for the management of alcohol withdrawal; however, as higher doses may result in benzodiazepine resistance, this may not be appropriate for all patients. There has been hesitance in using phenobarbital due to concerns of over-sedation and ineffectiveness; yet an expanding body of evidence has shown not only safety and effectiveness, but also improved outcomes. The purpose of this study was to compare the safety and effectiveness of phenobarbital for treatment of alcohol withdrawal when compared to benzodiazepines in a community hospital setting.

Methods: A retrospective quality improvement chart review was conducted pre- and post-implementation of institution specific guidelines utilizing phenobarbital in August of 2021. It included adult patients with high risk of alcohol withdrawal defined as those with a history of, or presenting with, delirium tremens and/or withdrawal seizures; and excluded patients who scored less than 8 on the Alcohol Use Disorders Identification Test â€“ Concise (AUDIT-C) score. The primary study outcome was the development or progression of alcohol withdrawal symptoms including seizures, hallucinations, or delirium tremens (DTs); and secondary outcomes included overall hospital length of stay (LOS), transfer to a higher level of care due to signs and symptoms related to alcohol withdrawal, or medication-related adverse effects (ADEs).

Results: A total of 62 patients were included in the retrospective chart review, 19 qualified in the pre-implementation data and 43 qualified for the post-implementation data. Majority of the patients included were 40-50-year-old men with history of seizures and an AUDIT-C score of 12. Of the patients who received benzodiazepines, 27.59% developed hallucinations, 10.53% experienced DTs and 5.26% had breakthrough seizures. Additionally, 84.21% of patients required additional therapy to control withdrawal symptoms, 26.3% experienced ADEs and approximately 50% of patients required transfer to a higher level of care. The average LOS was 6 days. Of the patients who received phenobarbital, 13.95% experienced hallucinations, but no patients developed DTs or seizures. Additionally, 9.3% of these patients required additional medications to control withdrawal symptoms, 9.3% had ADEs but none required transfer to a higher level of care. The average LOS was 3.5 days.
**Conclusions:** Phenobarbital was found to reduce the progression of breakthrough seizures, delirium tremens and hallucinations when compared to patients who received benzodiazepines. The findings of this retrospective quality improvement chart review support further use of a phenobarbital taper for patients at high risk of alcohol withdrawal.
Deprescribing of fall-risk increasing drugs using the VIONE tool: A collaborative emergency department and primary care pilot project

**Objectives:** Deprescribing initiatives have the potential to greatly improve patient safety by mitigating risk of adverse drug events and falls. One such initiative within the VA is the VIONE deprescribing tool which is embedded into the electronic health record and can be used to identify if each medication prescribed to a patient is vital (V), important (I), optional (O), or not indicated (N), and ensure that each medication has an associated indication (E). This study tested the implementation of the VIONE deprescribing initiative in primary care clinics with the use of emergency department visits to identify patient candidates who have experienced a fall or who are at an increased risk for polypharmacy-related adverse outcomes.

**Methods:** Patients were identified using emergency department (ED) visits during the study period that had fall-related ICD-10 codes and/or health factors, and were included if they had 15 or more active medications, a VIONE score greater than or equal to 3, and were discharged from the ED without being admitted. The medication list of patients fitting these criteria was reviewed using a standardized VIONE note template to identify potential medications for deprescribing related to falls and polypharmacy. All recommendations were then communicated to patient's primary care provider (PCP) for consideration. Data collected will include total number of medications deprescribed, recommendation acceptance rate, agents and classes of medications most often deprescribed, and potential cost savings afforded VACHS secondary to this initiative.

**Results:** The total number of medications deprescribed, recommendation acceptance rate, agents and classes of medications most often deprescribed, and potential cost savings afforded VACHS secondary to this initiative will be collected and results will be presented.

**Conclusions:** It is anticipated that this project will demonstrate the VIONE tool is a viable standardized process that can be utilized for deprescribing in the primary care setting. It is also anticipated that medications considered fall-risk increasing will be the most commonly deprescribed, and this project will allow for assessment of whether this is feasible to implement within ED and primary care settings across VACHS.
Title: Pharmacist-led assessment and intervention in younger diabetic population

Objectives: Diabetes is initially asymptomatic, and its insidious onset often goes undetected. Clinical inertia combined with a patient’s general resistance to lifestyle modification further complicates early detection and treatment. Recent population data show that younger at-risk adults are at an increased risk of developing diabetes and suffering from disease complications. The American Diabetes Association recommends routine screening of asymptomatic adults who are at high risk for developing diabetes. A retrospective pilot study evaluating rates of asymptomatic diabetes screening in this population demonstrated a need for further interventions. Assessing the impact of a pharmacist-led screening and intervention protocol can improve the adherence to these guidelines.

Methods: This prospective analysis identified patients aged 18-44 years, with a BMI > 25 kg/m2 (or > 23 kg/m2 in Asians), that were hospitalized for at least 48 hours. Patients must have had at least 1 additional risk factor for diabetes to be evaluated in the study. Patients were excluded for previously documented diabetes diagnosis or pregnancy. An active surveillance software was used to screen and collect data. Electronic health records of identified patients were reviewed to determine if laboratory screening for diabetes should be completed. Pharmacist-led interventions were completed for patients who had a positive screening result. The primary outcome was the rate of laboratory diabetic testing initiated in eligible patients during their hospitalization. Secondary outcomes evaluated the rates of pharmacologic and non-pharmacologic intervention during hospitalization, at discharge, and within 30 days of discharge. A chi-squared analysis was used to evaluate the primary outcome.

Results: The number and percentage of diabetes screenings completed will be recorded and results will be presented. These findings will be compared to a retrospective cohort from a pilot study previously conducted at our community medical center.

Conclusions: It is anticipated that this project will demonstrate a role for pharmacist-led diabetes assessment, screening, and intervention in order to increase compliance with current evidence based diabetes guidelines.
AUC Versus Trough Monitoring of Intravenous Vancomycin and its Effects on Acute Kidney Injury

Objectives: Vancomycin is the drug of choice for MRSA infections, but requires tedious therapeutic monitoring and has been associated with considerable nephrotoxicity. In most patients the target area under the curve (AUC) > 400 can be achieved at trough concentrations < 15 mg/L; therefore targeting trough concentrations of 15-20 mg/L may result in unnecessary drug exposure, hence increasing the risk for acute kidney injury (AKI). The objective of this study is to compare and evaluate rates of AKI between patients who received vancomycin and were therapeutically monitored based on trough levels to achieve a trough of 10-20, versus patients who received vancomycin and were therapeutically monitored through Bayesian modeling software based on AUC to achieve an AUC/MIC of 400-600.

Methods: A list of patients admitted to Inspira Medical Center Vineland and Mullica Hill between January 2020 and August 2021 that received vancomycin during their stay were compiled and reviewed according to the inclusion and exclusion criteria. They were split into two groups based on whether they were therapeutically monitored via AUC guidance or trough guidance. These accrued patients were then evaluated for the presence of AKI during their course of vancomycin, and up to 48 hours after their last dose.

Results: 218 patients were included in the analysis; 110 were monitored via AUC, and 108 were monitored via trough. The primary endpoint was the incidence of AKI defined by KDIGO criteria. The secondary endpoints were the effect of length of stay measured in days, and effect on mortality rate. 11% of patients in the AUC group, and 13 % of patients in the trough group (p=0.64) experienced an AKI regardless of stage. 5% of patients in the AUC group and 10% of patients in the trough group (p=0.13) had a stage 1 AKI; 6% of patients in the AUC group and 3% of patients in the trough group (p=0.24) had a stage 2 AKI. 14% and 9% of the AUC and trough group respectively were deceased before discharge (p=0.31); The median length of stay was 8 days vs 7 days in the AUC and trough groups respectively. (0.20( -1.95 to 1.56), P=0.83)

Conclusions: In patients admitted to Inspira Medical Center Vineland or Mullica Hill that received IV vancomycin during their stay, monitoring by AUC made no significant difference on rate of AKI, length of stay, or mortality rate, versus those who were monitored by trough. This suggests that the use of expensive Bayesian dosing software may not be necessary, as it
shows no clear benefit in reducing nephrotoxicity with vancomycin in comparison with trough monitoring. However, other benefits of AUC dosing may exist such as the ability to reach target vancomycin concentrations faster versus trough dosing. This would be especially useful in a critically ill patient.
Authors: Emily Casey, Chase Brown, Raymond Lamore, Vanessa Prendergast

Title: Venous thromboembolism prophylaxis in underweight patients

Objectives: The purpose of this study was to characterize pharmacologic venous thromboembolism prophylaxis (VTEP) prescribing and monitoring practices in general medicine patients at an academic medical center weighing ≤ 50 kg and to describe clinical outcomes.

Methods: This was a retrospective cohort study that included patients hospitalized at Penn Presbyterian Medical Center between 01/01/2018 and 01/01/2020. Patients were included if they were ≥ 18 years old, weighed ≤ 50 kg, were admitted to a general medicine floor, and received > 72 hours of pharmacologic VTEP. Patients were excluded if they were transferred to the ICU or had a surgical intervention within 72 hours of admission, admitted with an active bleed or an indication for therapeutic anticoagulation, experienced a thrombotic event within 48 hours of admission, or administered > 2 different VTEP regimens.

Results: A total of 190 subjects were included in this study; the majority were female, 168 (88.4%), with a median weight of 46.2 kg. Four separate VTEP dosing regimens were administered during this study period. The most common regimen was unfractionated heparin (UFH) 5000 units every 8 hours (82/190; 43.2%), followed by UFH 5000 units every 12 hours (50/190; 26.3%), enoxaparin 40mg every 24 hours (57/190; 30.0%), and UFH 2500 units every 12 hours (1/190; 0.5%). A total of 139 (73.2%) subjects received high-intensity VTEP (defined as ≥ 300 units/kg/day of subcutaneous (SC) UFH or ≥ 0.8 mg/kg/dose of daily SC enoxaparin), with subjects receiving a median weight-based dose of 306 units/kg/day and 0.83 mg/kg/day for heparin and enoxaparin, respectively. Anticoagulation monitoring was uncommon with follow-up aPTT checked in only 53 (27.9%) patients. Observed rates of bleeding and thrombosis were low, with five bleeding and two thrombotic events occurring during the study period.

Conclusions: Prescribing patterns for low body weight patients (≤ 50kg) are inconsistent at our institution and frequently result in the receipt of high intensity VTEP dosing regimens. The study was underpowered to comment on the safety of unadjusted VTEP dosing in the underweight population and monitoring was insufficient to draw conclusions regarding the degree of anticoagulation being provided. However, previously published reports would suggest that the intensity of anticoagulation was higher than intended. The implementation of an electronic medical record (EMR) alert that draws attention to patient weight in the VTEP
ordering process may be warranted. Additionally, standardized monitoring to detect clinically relevant aPTT elevations should be considered. Additional research is necessary to identify an optimal dosing regimen for VTEP in low body weight patients.
Assessment of opioid prescribing on discharge after common surgeries

Objectives: With the opioid epidemic, the misuse of opioids has been at an all-time high. Opioids are commonly used for acute pain management after surgery, higher doses are associated with an increased risk of addiction, overdose and death. National guidelines including Centers for Disease Control provide guidance on chronic pain management, but do not provide specific guidance for acute pain management especially post-operatively. Because of this, a wide variation exists when prescribing opioids on discharge after standardized surgeries. The Johns Hopkins Expert Panel developed recommendations for the ideal range of opioids to prescribe on discharge after selected surgeries. BronxCare Health System incorporated these recommendations into its policies and procedures. The objective of this study is to reduce unnecessary opioid exposure after surgeries. The primary outcome of this study is practitioners' adherence to prescribing recommendations.

Methods: This is a retrospective chart review to evaluate practitioners' adherence to BronxCare Health System's policy for opioid prescribing, which is based on the Johns Hopkins expert panel recommendations. A report was generated by the Electronic Health Record of all patients who were admitted for surgery from April 2021 to April 2022. Each patient's opioid prescription on discharge will be reviewed for compliance using the specific surgery type and number of oxycodone 5-milligram tablet equivalents. The study's inclusion criteria are as follows: 18 years of age and older, admitted for a surgery, opioid-naïve prior to surgery, and receipt of an opioid prescription post-surgery on discharge. The surgery categories include general surgeries, breast surgery, thoracic surgery, orthopedic surgery, gynecologic surgery, urologic surgery, otolaryngology, and cardiac surgery. Nominal data regarding compliance with the recommendations will be analyzed by Fisher's Exact test. Significance will be set at a p-value less than 0.05.

Results: The number and percentage of post-surgical opioid prescriptions that deviated from the recommendations will be evaluated and results will be presented.

Conclusions: It is anticipated that this performance improvement project will increase adherence to evidence-based recommendations and reduce the number of unnecessary opioid prescriptions on discharge.
Choi, Ara
Evaluation of the effectiveness of enoxaparin dose for venous thromboembolism prophylaxis in obesity

Conference Abstracts
May 16-18, 2022

Presenter Name: Choi, Ara
Organization: NewYork-Presbyterian Brooklyn Methodist Hospital
Category: General Clinical Practice
Day | Session | Room | Time: Tuesday | 3 | Magnolia A | 1:45:00 PM

Authors: Ara Choi, Pharm.D.; Catherine Chun, Pharm.D., BCPS, BCCP; Meggie Chan, Pharm.D., BCPS, BCCP, CACP; Marina Barsoum, Pharm.D., BCOP; Erin Y. Oh, B.A., Pharm.D., BCPS-AQ Cardiology; Fabienne L. Vastey, Pharm.D., BCPS

Title: Evaluation of the effectiveness of enoxaparin dose for venous thromboembolism prophylaxis in obesity

Objectives: Obesity is a major risk factor for venous thromboembolism (VTE). Enoxaparin is the preferred agent for VTE prophylaxis due to reduced dosing frequency and lower incidences of heparin-induced thrombocytopenia. Typical dosing regimen of subcutaneous enoxaparin for VTE prophylaxis is 40 milligrams (mg) daily. However, the literature on enoxaparin dosing in obese patients is limited to bariatric surgery patients. The purpose of this retrospective study is to evaluate the safety and efficacy of standard enoxaparin dosing (40 mg daily) compared to higher enoxaparin dosing (40 mg or 60 mg twice daily) for VTE prophylaxis in the obese population.

Methods: This is a retrospective observational study evaluating obese patients who received standard prophylactic enoxaparin dosing compared to higher prophylactic enoxaparin dosing at an academic teaching hospital. Patients 18 years of age or older with body mass index of 40 kg/m2 or greater who received prophylactic enoxaparin (30 mg, 40mg, or 60 mg) for more than 24 hours were included. The primary endpoint is the incidence of deep vein thrombosis and/or pulmonary embolism within 6 months post-discharge. The safety endpoint is the incidence of major bleeding during hospitalization.

Results: The number and percentage of VTE incidence and major bleeding events will be recorded and results will be presented.

Conclusions: It is anticipated that this project will provide guidance on optimal enoxaparin dosing for VTE prophylaxis in the obese population.
Phenobarbital versus Benzodiazepines for Alcohol Withdrawal in Hospitalized Patients

Authors: Melissa Dang, Jeffrey Endicott, LeeAnna Burgess, Carolyn Boscia, Amanda Kennedy, Bradley Tompkins

Title: Phenobarbital versus Benzodiazepines for Alcohol Withdrawal in Hospitalized Patients

Objectives: Benzodiazepines have been the standard of care for the management of alcohol withdrawal using a validated scale such as the revised Clinical Institute Assessment for Alcohol (CIWA-Ar) scale. Symptom-triggered dosing has demonstrated a decrease in overall benzodiazepine requirements, mechanical ventilation, and intensive care unit (ICU) length of stay. Barbiturates, including phenobarbital, have also been used for alcohol withdrawal and data have shown that it may prevent the need for escalation of care. Several studies have compared phenobarbital to benzodiazepines, and there has been a lower incidence of ICU admission, overall use of benzodiazepines, and hospital length of stay with phenobarbital. Phenobarbital could be a safe and efficacious option for patients experiencing severe alcohol withdrawal. It remains unknown whether one treatment is more advantageous than the other, specifically on non-ICU floors.

Methods: This IRB-approved, retrospective, cohort study included patients between January 2017 to September 2021 at The University of Vermont Medical Center (UVMMC). Patients were included if they were > 18 years old and initiated on the institution's CIWA protocol. Patients were excluded if they were initially admitted to the ICU or pregnant. Phenobarbital was considered for patients with severe alcohol withdrawal with a CIWA-Ar score > 15. Tailored towards previous benzodiazepine administration, phenobarbital was given. The primary outcome of this study was to compare the use of UVMMC’s phenobarbital dosing guideline versus symptom-triggered benzodiazepines on the length of stay for patients on non-ICU floors. Secondary outcomes included comparing the reduction in CIWA-Ar score, cumulative dose of benzodiazepines and phenobarbital, need for escalation of care, adverse effects (i.e. respiratory depression, bradycardia, hypotension), and death. All comparisons between treatment groups were analyzed by means of Wilcoxon rank sum tests and chi-squared or Fisher's exact test were used for categorical data.

Results: 107 patients received at least one dose of phenobarbital and 20 patients received only benzodiazepines. Baseline characteristics between treatment groups were similar. There was no difference in CIWA scores. The length of stay in the phenobarbital group was 67.4 hours and 94.2 hours in the benzodiazepine group, p=0.056. At 48 hours, the reduction of CIWA score
was -6 in those receiving phenobarbital vs -4 in the benzodiazepine group, p=0.373. No incidence of death or mechanical ventilation were observed in either group. There was no difference found in episodes of bradycardia and hypotension. Further data analysis will be performed upon completion of data collection.

**Conclusions:** Outcomes were similar between groups. There was a trend in decreased hospital length of stay and reduction of CIWA score within 48 hours in patients receiving phenobarbital compared to benzodiazepines alone. However, there was also a trend towards increased adverse effects in the phenobarbital group. Larger studies should be conducted to further assess the safety and efficacy of phenobarbital in patients with moderate to severe alcohol withdrawal compared to symptom-triggered benzodiazepines.
Assessing Risk Factors for Inpatient Hypoglycemia

Objectives: Hypoglycemic events in the hospital are a common but easily avoidable and cost healthcare organizations money due to significant negative impacts on the outcome of medical stays. The ability to identify risk factors for hypoglycemic events before they happen could correspond to lower healthcare spending in the hospital, decrease length of stays, and overall patient wellbeing. Ultimately, furnishing critical information on such a complication could promote the formulation of a risk stratification tool that can be used in inpatient settings. It is the objective of this study to stratify, categorize, analyze, and assess patient risk factors in the hopes that we can use these findings to prevent future hypoglycemic events in all hospitalized patients with diabetes.

Methods: Retrospective evaluation of available literature regarding risk factors for hypoglycemia events in hospitalized patients was performed. These factors were used to generate a table with all identified possible risk factors for hypoglycemia. This table was used to review the charts of two distinct groups of hospitalized patients: those who experience a hypoglycemic event and those who do not. Hypoglycemic events were defined as having any blood glucose level < 70 mg/dL with or without symptoms. Each subject was enrolled only once and only conditions surrounding the first identified episode of hypoglycemia during the admission were used. Patient charts were separated into two separate, but identical tables based on the two outcomes stated and data was collected over a period of 6 months. All charts between groups were collected using nominal, dichotomous variables (Y, N) or continuous if indicated (age, hemoglobin A1c). Statistical testing was performed to assess for significant differences in the prevalence of the identified risk factors between the two groups.

Results: Of the 278 charts reviewed, 25% did not meet the inclusion and exclusion criteria leaving 105 patients per group. The groups were separated based on point-of-care glucose levels above and below 70 mg/dL. Both groups were evaluated for the presence of similar characteristics including age, race, sex, types of home insulin, glycemic meds while in the hospital, and presence of comorbidities previously trialed through literature review. Of all data collected, significant data was found to be pertaining use of short or long-acting insulin use at home. It was found that 76.2% of patients (p<0.001) who had a hypoglycemic event while hospitalized were not on appropriate bolus insulin use at home. Additionally, 69.5% of patients...
(p<0.001) who experienced a hypoglycemic episode while hospitalized were not on appropriate long-acting insulin therapy at home.

**Conclusions:** In our study, we investigated possible distinguishing patient risk factors that might put them at risk of experiencing a hypoglycemic episode while hospitalized. Our results showed that a significant number of hypoglycemic patients were either not treated with home insulin, or only treated with one short- or long-acting agent where two may have been indicated. While this study holds some external validity, a larger scale trial would be required to assess the significance of the results found.
Presenter Name: Donadio, Nicole  
Organization: Jersey Shore University Medical Center Ñ Hackensack Meridian Health  
Category: General Clinical Practice  
Day | Session | Room | Time: Wednesday | 5 | Empire D | 12:45:00 PM

Authors: N. Donadio; J. Stanton; C. Ullo; T. Coco; Jersey Shore University Medical Center Ñ Hackensack Meridian Health, Neptune, New Jersey

Title: Evaluation of smoking cessation therapy orders in hospitalized patients (STOP)

Objectives: Smoking cessation pharmacotherapies are safe and effective in helping patients quit smoking. Although such medications are readily available, they may be underutilized in the hospital setting. Our institution currently does not have a smoking cessation protocol for early intervention in hospitalized patients. The purpose of this study was to determine whether smoking cessation therapies were offered and initiated for patients identified as active smokers during their hospital stay. In addition, we aimed to explore the prevalence of tobacco use in our patient population and identify potential opportunities for preventative health strategies relating to smoking cessation.

Methods: This is an IRB-approved, single-center, retrospective chart review designed to evaluate hospital smoking cessation therapy practices in patients identified as active smokers. Patients 21 years of age or older identified as active smokers and admitted to medical-surgical units from January 1, 2021 to June 30, 2021 were included. The primary endpoints were the number of patients prescribed nicotine replacement therapy (NRT) during their hospital stay and the number of patients discharged home with an NRT prescription. Secondary endpoints included the number of patients with documented smoking cessation counseling and the number of patients admitted for a high risk condition or respiratory disorder. Descriptive analyses were performed.

Results: Out of 1,210 patients identified as having an active smoking history in their chart during the study period, 605 were screened and 466 were included in the study. Most patients (77.5%) included in the study were identified as current every day smokers and 13.5% of the total included population were admitted for a high risk condition or respiratory disorder. A limited amount of patients were taking or initiated on smoking cessation therapy at home (7%), inpatient (28.5%), or upon discharge (16%). Additionally, 36% of patients received smoking cessation counseling during hospital admission.

Conclusions: The majority of patients included in this study were not initiated on smoking cessation therapy and did not receive smoking cessation counseling. The authors hope to utilize study findings to streamline the patient care approach in managing hospitalized patients identified as active smokers and provide targeted education on identified areas of improvement.
Such efforts include the creation of smoking cessation therapy order sets with guidance for appropriate pharmacotherapy and counseling documentation. The authors anticipate that implementing and maintaining best practices to improve smoking cessation management for hospitalized patients will support successful quitting and contribute to improved outcomes amongst motivated active smokers.
**Conference Abstracts**  
May 16-18, 2022

**Presenter Name:** Duff, Emily  
**Organization:** Baystate Medical Center  
**Category:** General Clinical Practice  
**Day | Session | Room | Time:** Wednesday | 5 | Empire D | 1:00:00 PM

**Authors:** Emily Duff, Erin Naglack, Danyel Adams; Baystate Medical Center, Springfield, MA

**Title:** Minimizing Hypoglycemia After Intravenous Insulin Therapy for Hyperkalemia in the Emergency Department

**Objectives:** Over 800,000 emergency department (ED) visits annually across the United States are due to hyperkalemia. Intravenous (IV) insulin regular is often utilized to manage hyperkalemia and is usually well-tolerated, however serious adverse events including hypoglycemia can occur despite concomitant dextrose administration. Baystate Medical Center’s (BMC) ED utilizes an order set for hyperkalemia management which included 10 units of insulin regular and point of care (POC) glucose checks every 15 minutes for one hour. There is data available demonstrating that using weight-based (0.1 unit/kg) insulin rather than a fixed 10 unit dose results in fewer hypoglycemic episodes while maintaining equivalent efficacy. The ED hyperkalemia order set was updated to include 0.1 unit/kg IV insulin regular dosing (maximum 10 units) and expanded POC glucose monitoring from one hour to a total of four hours. The objective of this project was to evaluate if the updated order set utilizing weight-based IV insulin regular dosing will minimize rates of hypoglycemia without affecting the potassium lowering efficacy compared to the previous fixed-dose order set.

**Methods:** This single-center, retrospective chart review quality improvement project will include patients with hyperkalemia (potassium greater than 5 mEq/L) treated with IV insulin regular in the ED at BMC. Exclusion criteria consisted of patients who were less than 18 years old, received insulin products for indications other than hyperkalemia between potassium levels, were treated with hemodialysis between initial and subsequent potassium levels, or received continuous dextrose fluids during the POC monitoring period. Patient-specific data were collected before and after the ED hyperkalemia order set changes. The primary outcome is rates of hypoglycemia (blood glucose less than 70 mg/dL). Secondary outcomes include reduction of potassium levels, need for additional potassium lowering agents, usage rates of the updated order set, and compliance with the updated order set.

**Results:** From August 1, 2021 to October 31, 2021, the rate of hypoglycemia with the fixed-dose insulin regular order set was 26.5% (18/68 patients). From December 1, 2021 to February 28, 2022, the rate of hypoglycemia with the updated weight-based IV insulin regular order set was 18.6% (11/59 patients). The results of the secondary outcomes will be recorded and presented.
Conclusions: It is anticipated that this project will demonstrate a reduced rate of hypoglycemia with the utilization of weight-based IV insulin regular dosing compared to a fixed dose of 10 units for hyperkalemia management while maintaining equivalent potassium lowering efficacy.
Impact of a pharmacist-managed protocol on the safety and efficacy of warfarin therapy for patients admitted in an acute care setting

Authors: S. Fazio, D. Nguyen; Lankenau Medical Center (LMC), Wynnewood, PA

Title: Impact of a pharmacist-managed protocol on the safety and efficacy of warfarin therapy for patients admitted in an acute care setting

Objectives: The complexity of warfarin dosing necessitates close monitoring due to the number of drug interactions, unpredictable environmental factors, and variability among patients. The objective of this study is to evaluate the safety and efficacy of pharmacist-managed warfarin dosing compared to provider-managed warfarin dosing in an acute care setting.

Methods: All patients who received warfarin while admitted to a Main Line Health System (MLHS) acute care facility were screened for inclusion until a sample of at least 60 patients was obtained. A retrospective chart review was conducted for patients aged 18 years or older who received warfarin for at least three days with an INR goal of 2-3. Pregnant patients, patients being bridged with argatroban, and patients admitted to the cardiothoracic intensive care unit were excluded. Data was collected and analyzed to evaluate outcomes such as time in therapeutic INR range (TTR), incidence of major bleeding, and frequency of critical INR values. Analysis of the data was conducted using inferential and descriptive statistics as available in Microsoft Excel.

Results: 1601 patient charts were identified through the electronic medical record to be screened for inclusion between January 1, 2020 and December 31, 2020. 115 patients were included in the analysis, 78 in the provider-managed group and 37 in the pharmacist-managed group. The mean TTR across MLHS was 47.1% in the provider-managed group vs 36.8% in the pharmacist-managed group (P = 0.12). There were 2 major bleeding events in the provider-managed group and 1 major bleeding event in the pharmacist-managed group. Among patients newly started on warfarin, there were fewer critical INR values in the pharmacist-managed group.

Conclusions: Similar results were observed for patients in the provider-managed and pharmacist-managed groups. There was no difference in the safety or efficacy of pharmacist-managed warfarin dosing compared to provider-managed warfarin dosing. Further study comparing data pre-implementation and post-implementation of the pharmacist managed warfarin protocol may help solidify results.
Phenobarbital concentration correlation with efficacy and safety in alcohol withdrawal syndrome (AWS)

Objectives: Alcohol use disorder is currently ranked as the seventh leading cause of death and disability around the world. Treatment options for patients in the emergency department and patients admitted to general medicine units with AWS include lorazepam and phenobarbital, alongside other adjunctive agents. Due to the increased risk of respiratory depression and toxicity concerns, phenobarbital concentration monitoring in patients with AWS was initiated at our institution. However, the only indication for which there are validated serum targets for efficacy is seizure disorders, with a trough goal of 10-40 mg/L. In the setting of alcohol withdrawal, data are lacking regarding appropriate serum concentrations to maximize efficacy, while also minimizing toxicity. Target concentrations at our institution vary in range from 6-15 mg/L and notably are not validated in patients with AWS. This study aims to further investigate phenobarbital concentration correlation with safety and efficacy, specifically focusing on the intramuscular (IM) route of administration.

Methods: We conducted a retrospective, single center chart review of 100 adult patients (≥18 years of age) treated at Massachusetts General Hospital who received IM phenobarbital for AWS from February 2020 to May 2021. Patients included were monitored with the clinical institute withdrawal assessment scale- alcohol, revised scoring tool (CIWA-Ar), received 3 doses of IM phenobarbital totaling 6-12 mg/kg based on ideal body weight, and had phenobarbital concentrations drawn 4-8 hours following their last dose. The primary outcome was efficacy of phenobarbital based on concentration monitoring and CIWA-Ar scores following completion of an IM phenobarbital load. Secondary outcomes included hospital length of stay, incidence of mechanical ventilation, intensive care unit admissions, medication-related adverse events, and use of adjunctive medications to treat alcohol withdrawal symptoms.

Results: The phenobarbital concentrations, CIWA-Ar scores, and secondary outcomes results will be presented.

Conclusions: This retrospective analysis will provide additional data regarding the utility of phenobarbital concentration monitoring to determine safety and efficacy of IM phenobarbital in patients with AWS.
Patient education on self-administration of insulin via pen: Assessment of nurses' knowledge and performance

Objectives: At our institution, insulin is administered by needle and syringe; however, patients may be prescribed insulin pens upon discharge. Adult general floors, at present, do not have formal nurse-led patient education on self-administration of insulin via pen. Therefore, patients being discharged with new prescriptions for insulin pens may not be aware of proper injection technique, which may lead to poor health outcomes. The purpose of this study is to evaluate a nursing education module for providing patient discharge education of insulin injection via pen.

Methods: This is an interventional pre-post study piloted in one inpatient adult unit. Nursing staff were provided education on this subject through in-service presentation, hands-on demonstration, and distribution of a reference guide. Methods used for developing nursing education for the adult setting mirrored education practices already established in the pediatric hospital, and were modified for an adult population. The primary endpoint was the change in nurses' knowledge and performance of patient education and technique of insulin self-administration via pen. Change in knowledge was evaluated through pre- and post-assessments, and performance was assessed through a standardized simulated patient education activity. Data from the pre- and post-assessment were collected using an online survey software platform (Qualtrics®) and compared using the Wilcoxon signed-rank test, and performance from the simulation activity was measured with descriptive statistics.

Results: A total of 31 nurses participated in the study. The pre- and post-assessments consisted of five questions assessing nurses' confidence on insulin pen patient education and five questions assessing knowledge. The questions evaluating confidence were measured using a Likert scale, and there was no statistically significant difference found between the pre- and post-assessments. A multiple-choice format was used for the questions evaluating knowledge. A statistically significant improvement was seen in the question regarding priming of the insulin pen (p=0.002) and storage requirements (p=0.039). Seventeen of the 31 nurses participated in the simulated patient education activity. Of these nurses, 88% properly demonstrated preparation of pen, assembly of pen, proper injection techniques, and safe disposal of insulin.
pen needles. The steps for patient counseling that were missed most often (less than 25% nurses) included monitoring parameters and adherence/follow-up with physician.

**Conclusions:** The results of this study will be used to inform best practices in adult education on insulin self-administration via pen, which will be used to implement nursing staff education hospital-wide.
Conference Abstracts
May 16-18, 2022

Presenter Name: Hathaway, Emily
Organization: King's Daughters Medical Center
Category: General Clinical Practice
Day | Session | Room | Time: Tuesday | 3 | Magnolia A | 1:00:00 PM

Authors: Emily Hathaway, PharmD, Anthony Nowling, PharmD, Chris Raich, PharmD

Title: Implementation of Pharmacist Response to Code Blues Hospital-Wide

Objectives: Pharmacist response to code situations has been shown to reduce medication errors and mortality which has prompted the desire to change the practice at our institution. Currently, there is only pharmacist code blue coverage in the ICU and ED during the clinical pharmacist's hours. All pharmacists will be required to be trained to respond to code situations. A training program will be implemented for pharmacists to complete prior to being approved to attend code situations alone.

Methods: A training program including BLS and ACLS certification, an in-person learning workshop, code observations with an experienced pharmacist during their hours (Monday through Friday 1100-1930), and a mock code blue simulation will all be required prior to the pharmacist attending codes alone. The learning workshop will be pharmacist-led with a focus on medications included in the ACLS algorithm and bedside medication compounding. Once all pharmacists have completed the requirements, the hospital staff will be notified of the expanded hours and expanded locations of pharmacist code blue coverage.

Results: As of now, 39% of pharmacists have responded to at least one code. As the majority of the staff had never attended a code, there was a generalized feeling of anxiety surrounding the process at the beginning. We found that with the provision of code observations and pharmacy focused education it eased the anxiety within the staff. Prior to initiation of this project, 40% of the on-site pharmacists were BLS and ACLS certified. After implementation, 100% of on-site pharmacists are certified in BLS and ACLS and it is integrated into the training grid for newly hired pharmacists.

Conclusions: Overall, inclusion of a pharmacist during medical code situations is recommended due to decreased mortality and reduced medication errors for patients. A program has been implemented at our hospital to prepare pharmacists for code response in order to be a vital part of responding to code blue situations.
Authors: M. Jeghers, C. Ji, K. Newman, R. Roberts; Massachusetts General Hospital (MGH), Boston, Massachusetts

Title: Evaluation of pharmacist involvement in emergency response

Objectives: Emergency response teams are designed to promptly deliver care to hospitalized patients experiencing acute decompensation events. Pharmacists have become an integrated part of the inpatient adult emergency response team and their presence at code blue events has been shown to significantly improve adherence to advanced cardiac life support (ACLS) guidelines. At Massachusetts General Hospital (MGH), two clinical pharmacists are designated to carry an emergency response pager and respond to all hospital emergencies including cardiac arrest (code blue), code stroke, and rapid response during the hours of 07:30-22:30, and then downsize to one clinical pharmacist during the after-hours of 22:30-07:30. During an emergency response call, pharmacists are responsible for managing all items located in the code cart, preparing and retrieving medications, and providing medication and dosing recommendations to the emergency response team. This study assesses the impact of pharmacist involvement at emergency responses as well as the time dedicated to emergency response by clinical pharmacists.

Methods: A single-center, retrospective chart review was performed assessing both inpatient and ambulatory emergency responses for patients at least 18 years of age from August 2021 through January 2022. Emergency response event-specific information was assessed using electronic medical records and intervention documents (iVents) composed by responding pharmacists. Information gathered included patient age, type of emergency response, medications used, interventions made by pharmacists, and a timeline of agents administered. The amount of time dedicated to emergency response by pharmacists was then converted to full time employee (FTE) equivalents.

Results: A total of 296 emergency response iVents were assessed and 242 total responses were included in data analysis. The primary outcome of time pharmacists dedicate to emergency responses over a six-month period was found to be 9,480 min (158 hrs), with average amount of time spent at each response being 40.7 min (SD 27.4 min), ranging from 5 to 210 min. This is equivalent to approximately 0.15 (15%) of an FTE (158 hrs / 1040 hrs in 6 months = 0.15). Given that two pharmacists respond to each emergency response, in total 0.30 (30%) of an FTE spent by pharmacists responding to emergency responses.
**Conclusions:** The total amount of time spent by clinical pharmacists at emergency responses within a six-month period is equivalent to approximately 30% of one FTE. It is anticipated that this project will also demonstrate positive impact of pharmacist participation in adult emergency response on patient outcomes and adherence to ACLS guidelines.
Comparing time to therapeutic anti-factor xa levels when switching from enoxaparin or heparin prophylaxis to heparin treatment

Authors: K. Dilley; M. Jenkins; M. Montavon; Southern Ohio Medical Center (SOMC) Portsmouth, Ohio

Title: Comparing time to therapeutic anti-factor xa levels when switching from enoxaparin or heparin prophylaxis to heparin treatment

Objectives: This study will aid in the determination of which prophylactic medication would be most effective in reaching a patient's goal anti-factor Xa level.

Methods: The medical records of patients who visited SOMC in Portsmouth, Ohio during a twelve month period were reviewed. Patients were screened and eligibility was determined based on inclusion and exclusion criteria. Data of those eligible was then collected and integrated into an excel spreadsheet based on the venous thromboembolism (VTE) prophylactic medication used prior to starting a heparin drip; heparin or enoxaparin. VTE prophylactic doses were defined as heparin 5,000 units every 8 hours, enoxaparin 30 mg once or twice daily, and enoxaparin 40 mg once daily. The anti-factor Xa levels of each patient were collected and compared to one another to determine which VTE prophylactic medication led to faster goal anti-factor Xa levels, 0.3-0.7 IU/mL, once starting a heparin drip.

Results: All of the patients that had received heparin VTE prophylaxis had their first/baseline anti-factor a level result at less than 0.1 IU/mL, while only twenty-two percent of patients that had received enoxaparin VTE prophylaxis had theirs result at less than 0.1 IU/mL. In the patients that took heparin, the average amount of anti-factor Xa post baseline level draws that were drawn before reaching a therapeutic level was three and for patients that took enoxaparin it was two. Three of the patients that took heparin prior to starting the drip did not reach therapeutic levels during their treatment time as well as one of the patients that took enoxaparin. Statistical analysis results will be presented.

Conclusions: Of the VTE prophylactic drugs, enoxaparin showed a quicker time to therapeutic level based on anti-factor Xa results as well as higher baseline results. The patient population used in this study was small and uneven in the two groups, seventeen and nine for heparin and enoxaparin respectively. These results could potentially be used when deciding which medication would aid in higher anticoagulation capabilities in patients. Further research needs to be done with larger study populations to confirm these findings.
Evaluation of enoxaparin dosing in obesity for venous thromboprophylaxis

**Objective:**
Low molecular weight heparin is a commonly used agent for treatment and prevention of venous thromboembolism. Current guidelines do not have clear recommendations on the dosing of enoxaparin in obese patients for venous thromboembolism prophylaxis. The purpose of this study is to evaluate the utilization of our institutions enoxaparin dosing guidance for thromboprophylaxis in patients weighing greater than 140 kg, at The Unity Hospital of Rochester.

**Methods:**
A single-center, retrospective, chart review was conducted between January 1st 2021 to December 31st 2021 to include patients who received at least 1 dose of enoxaparin for the prevention of venous thromboembolism and weighed more than 140 kg. Patients excluded from this evaluation were those who had a positive result for COVID-19 during admission or were post-operative. Outcomes assessed included appropriateness of dosing based on our institutional dosing guide and occurrence of any adverse events. Adverse events included, but not limited to, are bleeding, formation of thrombus, incidence of heparin-induced thrombocytopenia (HIT).

**Results:**
The percentage of treatments that deviated from the weight dose guidance will be recorded and presented. The percentage of adverse events based on the dosing strategy group will be recorded and presented.

**Conclusions:**
It is anticipated that this study will identify areas of improvement for our systems enoxaparin dosing guidance. Overall, patients receiving higher than recommended dosing are anticipated to have higher bleeding events and those under-dosed are anticipated to have greater thrombotic events.
A retrospective evaluation of epoetin alfa in myocardial infarction and cerebrovascular accident

**Objectives:** OBJECTIVES: Patients with anemia due to chronic kidney disease (CKD) are often treated with epoetin alfa. However, epoetin alfa has a boxed warning for increased risk of myocardial infarction (MI) and cerebrovascular accident (CVA). As an institution, we currently do not have a standardized practice for target hemoglobin (Hgb) level or dosing strategy in patients admitted for MI or CVA. The package insert recommends interrupting treatment if Hgb >11 g/dL for CKD on dialysis and Hgb >10 g/dL for CKD not on dialysis. The Kidney Disease Improving Global Outcomes (KDIGO) guidelines recommend decreasing epoetin alfa dose by 25% when Hgb approaches 11.5 g/dL. The primary objective of this study is to describe prescribing patterns of epoetin alfa stratified by Hgb levels for patients admitted for MI and CVA. Other endpoints included 30-day mortality or readmission due to thrombotic events.

**Methods:** METHODS: A single-center retrospective cohort study was conducted on patients who were admitted to ChristianaCare from January 1, 2015 to November 30, 2021. Eligible patients were > 18 years of age, admitted for MI or CVA, and received epoetin alfa for anemia associated with CKD as home therapy. Patients were excluded if Hgb was obtained >24 hours of admission, Hgb < 7 g/dL, or if length of stay was < 3 days. Data collected included patient demographics, dialysis status, and home, hospital, and discharge dose and route of epoetin alfa. Endpoints were analyzed using the Chi-square or Fisher's exact tests for categorical data.

**Results:** RESULTS: The baseline characteristics were similar between the groups. 61 patients were included and were stratified into four different groups based on admission Hgb levels. Hgb 7.1-9.9 g/dL [n=23], Hgb 10-11.4 g/dL [n=22], Hgb 11.5-13 g/dL [n=12], and Hgb >13 g/dL [n=4]. Of the 61 patients 24 patients (39.3%) had their home ESA dose increased or continued and 37 patients (60.7%) had their home ESA dose decreased, held, or discontinued. The primary outcome was statistically significant between prescribing patterns stratified by Hgb levels (p=0.048). For Hgb between 7.1 to 9.9 g/dL, prescribers were more likely to increase the dose or continue home dose (58.3%) compared to decreasing, holding, or discontinuing the home dose (24.3%). For Hgb 11.5 to 13 g/dL, prescribers were more likely to decrease the dose, hold, or discontinue therapy (27.0%) compared to increasing or continuing home dose (8.3%). There
was no difference in 30-day mortality (p=0.553) or readmission due to thrombotic events (p=0.373).

**Conclusions:** Results of this study will be used to better understand prescribing patterns for CKD patients on epoetin alfa admitted for MI or CVA in terms of patient safety and determine possible risk factors for the development of further thrombotic events.
Comparison of steroid treatments in pediatric asthma exacerbations

Authors: L. Luong, H. Oti; Bon Secours St. Mary's Hospital, Richmond, Virginia

Title: Comparison of steroid treatments in pediatric asthma exacerbations

Objectives: Current literature supports the use of either prednisone derivatives (prednisone, prednisolone, methylprednisolone) or dexamethasone to treat asthma exacerbations in hospitalized children; however, there is no definite consensus recommendation regarding which corticosteroid is preferred. The objective of this study was to determine the effect of dexamethasone versus prednisone derivatives on clinical and safety outcomes in pediatric patients hospitalized for the treatment of asthma exacerbations.

Methods: This study was an IRB-reviewed, single-center, retrospective chart review conducted at a community hospital. Historical chart review was conducted for pediatric patients aged 2 to 17 years who were admitted to the pediatric hospitalist service for an asthma exacerbation between January 1, 2019, and January 1, 2021. All included patients had received a systemic corticosteroid as well as albuterol therapy at an interval of every 2 hours or greater. Patients were excluded if they required initial pediatric intensive care unit (PICU) level of care, received a combination of different systemic corticosteroids during admission, received prolonged corticosteroid therapy within 7 days prior to admission, or had a concomitant excluding diagnosis. The primary outcome of the study was hospital length of stay, with secondary outcomes including transfer to higher level of care, emergency department (ED) readmission to a Bon Secours Richmond facility due to asthma within 30 days of discharge, time to wean albuterol therapy and oxygen support, incidence of vomiting, administration of anti-emetic medications, and re-dosing of corticosteroid due to intolerance.

Results: A total of 62 patients met inclusion criteria and were included for statistical analysis. For both the dexamethasone (n=37) and prednisone derivative (n=25) groups, results regarding primary and secondary outcomes will be recorded and presented.

Conclusions: It is anticipated that this project will help to characterize efficacy and safety outcomes related to systemic corticosteroid selection for the treatment of asthma exacerbations in hospitalized pediatric patients. The results of the study may provide insight into current practices at a community hospital, facilitate prescriber education, and potentially aid in the development of hospital guidance and standardization of prescriber practice.
**Authors:** Zachary Lusk, PharmD; Kristin Marge, PharmD, BCPS; Laura Monroe-Duprey, PharmD

**Title:** Improving sodium correction in a community hospital

**Objectives:** The objective of the study was to prospectively assess whether pharmacist intervention on patients with sodium disorders would reduce the incidence of hospital-acquired hypernatremia or the incidence of readmissions related to drug-induced hyponatremia.

**Methods:** This was a single-center quality improvement project. From Jan. to Mar. 2022, patients with hypernatremia or severe hyponatremia were assessed daily for potential intervention. Patients were excluded if they did not have two lab reported sodium values. Recommendations included increased lab monitoring, fluid management, custom drug diluents to minimize sodium, free water replacement with enteral nutrition, and discharge medication reconciliation. Patients were compared to a retrospective group that had not received these new targeted pharmacist interventions. Patient data collected included serum electrolyte levels and relevant past medical history. Outcome data included LOS, discharge disposition, 30-day readmission, and mortality. Last, data on sodium correction included length of stay until correction, rate of correction, and correction status at discharge. The co-primary outcomes assessed were the rate of severe hypernatremia (>155mEq/L) and frequency of readmissions for hyponatremia. A student-t test was used to determine statistical significance. Secondary outcomes assessed included the rate of correction and days required to achieve correction.

**Results:** Results pending completion of data collection.

**Conclusions:** It is anticipated that this project will demonstrate a role for greater pharmacist involvement with sodium management.
Concordance of high partial thromboplastin time values to anti-Xa levels during therapeutic unfractionated heparin management

Objectives: Unfractionated heparin (UFH) has unpredictable pharmacokinetic characteristics and the optimal method to monitor its anticoagulant effects is not yet identified. This study aims to evaluate the discordance between in-range anti-Xa (gold standard) and supratherapeutic partial thromboplastin time (PTT) levels (surrogate) defined as greater than or equal to 100 sec and to identify patient characteristics associated with discordance

Methods: Men and women over the age of 18 and receiving therapeutic UFH with a PTT level of greater than or equal to 100 sec were included. Patient demographics, clinical characteristics, medications, and laboratory values were extracted from the medical record. An analysis of the discordance of PTT and anti-Xa levels was performed. For context, anti-Xa is the gold standard and PTT is used as a surrogate of degree of anticoagulation. The primary endpoint was the discordance between supratherapeutic PTT levels and in-range anti-Xa assays. The secondary endpoints include the rate of discordance, the relationship between patient characteristics and PTT versus anti-Xa discordance, the frequency of UFH dose adjustments or infusion interruptions, and the time to reach therapeutic anticoagulation with the current UFH protocol. Chi-squared test was used to compare categorical data; independent samples t-test and Wilcoxon Rank Sum were used to compare normally and non-normally distributed continuous data, respectively.

Results: Heparinized PTT was discordant to anti-Xa in 24 (27.2%) of 88 samples, in turn, requiring unnecessary dose adjustment. In patients with a PTT above 100 sec, the correlation of this surrogate measure to anti-Xa was poor ($r^2=0.32$) after excluding PTT values exceeding the limit of detection (PTT greater than 200). As PTT rose to greater than 200 sec, the discordance to anti-Xa was diminished (8.1%). Additional analyses are currently in process.

Conclusions: The use of PTT to monitor UFH requires a re-evaluation. Using PTT may result in unnecessary dosage adjustments, held doses, and increased workload for both laboratory personnel and nursing.
**Presenter Name:** Mirza, Sumeen  
**Organization:** University of Maryland Medical Center (UMMC), Baltimore, Maryland  
**Category:** General Clinical Practice  
**Day | Session | Room | Time:** Tuesday | 3 | Magnolia A | 1:15:00 PM

**Authors:** S. Mirza, S. Yan Amy Yeung, Z. Noel, C. Ng  
**Title:** Impact of clinical decision support system for identifying patients with high risk of QT interval prolongation

**Objectives:** Hospitalized patients are at an increased risk of drug induced QT prolongation, which is a risk factor for sudden cardiac death and may increase hospital length of stay and risk of mortality. One potential mitigation strategy is to incorporate Tisdale score (a validated risk score for predicting QT prolongation) into a pop-up style interruptive clinical decision support (CDS). The purpose of this study is to evaluate the impact of the CDS on the discontinuation of QT prolonging medications within 1-hour of the triggering of interruptive CDS and the incidence of ordering of ECG monitoring within 1 hour after the alert was triggered and the incidence of QT prolongation (QTc > 500) in this patient population.

**Methods:** This was a retrospective cohort study before and after implementation of the CDS. The study included adult patients hospitalized for more than 24 hours at 9-hospitals within a health system. Data was collected from adult patients hospitalized for more than 24 hours during a “silent phase” (PRE)- prior to interruptive CDS implementation - and from an “active phase” (POST)- post interruptive CDS implementation. Interruptive CDS alerts triggered upon ordering of a QT prolonging drug in patients with moderate-to-high Tisdale risk score and/or a QTc > 500 msec on admission. Data collected included patient baseline demographics (age, sex, admission diagnosis, comorbidities, length of hospitalization, admission QTc, maximum QTc), medication that triggered the alert, at the time of the alert- the number of active QT prolong agents, patient level of care, telemetry status, and provider level of training-, discontinuation of triggering medication, and an order for ECG monitoring.

**Results:** A total of 870 alerts were evaluated, with 435 alerts in each phase. There was no difference in the incidence of discontinuation of QT prolonging agent with implementation of CDS (PRE 48.3% vs POST 49.7%), as well as incidence in ECG monitoring order (5.4% vs 7.1%). A higher incidence of cardiac monitoring (not ECG) was performed in the POST group (3 vs 11). Additionally, during hospitalization 68.9% of the patients had an incidence of QT prolongation in the PRE group compared to 72.8% in the POST group.

**Conclusions:** Based off preliminary results, the interruptive CDS did not result in higher discontinuation of QT prolonging medications or ordering of ECG monitoring.
**Presenter Name:** Moussa, Carolin  
**Organization:** Huntington Hospital  
**Category:** General Clinical Practice  
**Day | Session | Room | Time:** Poster

**Authors:** C. Moussa, PharmD; J. Fiebert, PharmD, BCPS, BCGP, BC-ADM

**Title:** Analysis of hyperglycemia in the medical-surgical population in a community hospital

**Objectives:** Uncontrolled hyperglycemia is associated with poor outcomes in hospitalized medical-surgical patients. The American Diabetes Association recommends a target glucose range of 140-180 mg/dL for the majority of non-critically ill patients. The purpose of this initiative is to assess and characterize hyperglycemia occurrences in the medical-surgical population at our hospital as well as prospectively identify hospitalized patients with hyperglycemia (defined as blood glucose ≥250 mg/dL). Patient-specific pharmacotherapy modifications will be recommended for these patients with the aim to improve management of non-critically ill patients with diabetes.

**Methods:** Patients with hyperglycemia defined as ≥1 point-of-care testing (POCT) blood glucose values ≥250 mg/dL admitted to medical-surgical units at Huntington Hospital will be included in this initiative. Patients will be identified by a pharmacist in real-time on a daily basis using the Remote Automated Laboratory System report during a 3-month period, where patient-specific interventions will be recommended to prescribers by a pharmacist. This study will exclude patients who have been admitted for <24 hours. Additionally, educational opportunities for improved management of inpatient hyperglycemia will be identified and provided for prescribers, nursing and pharmacy staff. IRB approval is not needed in this quality initiative.

**Results:** A total of 331 reviews were conducted during the study period, which included 133 patients. When analyzing the severity of hyperglycemia, 56.2% of the reviews were severe hyperglycemic events (blood glucose >300 mg/dL). Upon further breakdown, 43.8% of the reviews conducted had a maximum POCT value between 250-300 mg/dL, 27.8% between 301-350 mg/dL, 16.9% between 351-400 mg/dL and 11.5% above 400 mg/dL. Pharmacy driven interventions were conducted daily, which included adjusting basal/bolus insulin regimen, adding basal or bolus insulin, changing diet to consistent carbohydrates, etc. The majority of interventions involved adjusting basal/bolus insulin regimens. Educational in-service sessions were provided during the study period for prescribers and nursing staff regarding optimizing glycemic management.

**Conclusions:** Based on our analysis of hyperglycemic events in the medical-surgical population over a 3-month period, the majority of the hyperglycemic events in our institution consisted of severe hyperglycemia (blood glucose over 300 mg/dL). The analysis identified
opportunities for better glycemic control in this population, with a particular need to address severe hyperglycemia.
Authors: J. Patel, M. Flores, J. Gonzalez, J. Wilczynski, M. Yacoub; Jersey Shore University Medical Center - Hackensack Meridian Health, Neptune, New Jersey

Title: Evaluation of appropriate dosing of enoxaparin for venous thromboembolism prophylaxis in obese patients (DosE VTE)

Objectives: Venous thromboembolism (VTE) is a disease associated with significant morbidity and mortality, which is further compounded by obesity. The National Comprehensive Cancer Network (NCCN) 2021 guidelines and other literature provide recommendations for prophylactic dosing of enoxaparin in hospitalized obese patients, which serve as the basis for the authors' institution-specific guidelines; however, it's unclear how often these patients are accurately prescribed enhanced thromboprophylaxis. The purpose of this study is to evaluate if provider education can promote optimal dosing of enoxaparin in obese patients for VTE prophylaxis based on hospital guideline recommendations.

Methods: This is a two-part observational study of obese hospital inpatients receiving enoxaparin for VTE prophylaxis prior to (January 1, 2021 through June 30, 2021) and then following (December 23, 2021 through February 28, 2022) an educational session with prescribers. Patients were included if they were ≥ 18 years old, received enoxaparin prophylaxis for VTE, were medically ill, and had a BMI ≥ 40 kg/m², but were excluded if they were pregnant, were in intensive care or trauma units, or had any of the following: a past medical history of VTE; any indication for therapeutic anticoagulation; creatinine clearance (CrCl) < 30 mL/min; a history of heparin-induced thrombocytopenia (HIT); a bleeding disorder; or an active bleed. Endpoints of the study include: the appropriateness of enoxaparin dosing for VTE prophylaxis relative to hospital guidelines; VTE occurrence during the index admission; 30 day readmissions due to VTE; length of therapy; length of hospital stay; and safety outcomes.

Results: In the pre-education phase, 293 patients were reviewed of which 73 patients were included for analysis. For the primary endpoint, only 7/73 (9.6%) patients received an appropriate dose of enoxaparin for VTE prophylaxis relative to our hospital guidelines. No patients experienced a VTE during their index admission, and one (1.4%) patient was readmitted within 30 days due to VTE. Patients were on enoxaparin therapy for a median of 4.2 days and had a median length of stay of 4.7 days. Six (8.2%) patients experienced an episode of bleeding while on enoxaparin. Out of the six bleeds, four were minor bleeds and two were major bleeds which required transfusions. None of the bleeds resulted in death. All endpoints
assessed prior to the educational session will be analyzed and reported for patients in the post-education group when the analysis is complete.

**Conclusions:** The authors hypothesize that provider education can promote optimal dosing of enoxaparin in obese patients for VTE prophylaxis based on hospital guideline recommendations.
Hypoglycemia in patients receiving sulfonylureas or repaglinide during inpatient admission

**Presenter Name:** Poli, Tyler  
**Organization:** Albany Med Health System  
**Category:** General Clinical Practice  
**Day | Session | Room | Time:** Monday | 1 | Empire D | 1:45:00 PM

**Authors:** T. Poli, S. Konduru  

**Title:** Hypoglycemia in patients receiving sulfonylureas or repaglinide during inpatient admission  

**Objectives:** Sulfonylureas and meglitinides are commonly used to improve glycemic control in patients with type 2 diabetes mellitus (T2DM). These agents stimulate insulin release from the pancreas via the ATP sensitive potassium channels therefore, their most common side effect is hypoglycemia. Hospitalized patients, who may have dietary restrictions, would have increased risk of hypoglycemia. Duration of action of sulfonylureas, which can be 24 hours or more, can potentially prolonging the risk of hypoglycemia. The purpose of this study is to determine the incidence of hypoglycemia in patients taking sulfonylureas or meglitinides during hospitalization.

**Methods:** This retrospective chart review of inpatients older than 18 years old from July 2019 to June 2021 evaluated the percentage of patients experiencing hypoglycemia while receiving sulfonylureas or repaglinide. Hypoglycemia and severe hypoglycemia were defined as < 70 mg/dL and < 50 mg/dL respectively. Episodes of hypoglycemia were considered to be related to sulfonylureas if it occurred within 24 hours of the last administered dose (36 hours for eGFR < 30 mL/min/1.73m2) and related to repaglinide if within 6 hours of last administered dose. Data collection included patient demographics, medication administration data, and laboratory data. Primary endpoints included the percentage of patients with hypoglycemia, with severe hypoglycemia, percentage of patients with hypoglycemia secondary to fasting (defined as NPO status before or up to 24 hours after drug administration), percentage of patients with hypoglycemia based on age less than versus older than 65 years, and percentage of patients with hypoglycemia on medical versus surgical services. Appropriate descriptive statistics were utilized.

**Results:** Five hundred and eighteen patients were screened, 133 were excluded due to no recorded glucose 24-hours post administration of a sulfonylurea or repaglinide. A total of 385 patients were included in the analysis. Thirty-seven (9.6%) had a finger stick glucose or serum glucose less than 70 mg/dL within the allotted timeframe. Five patients (1.3%) had a fingerstick or serum glucose less than 50 mg/dL. Of the 37 patients who were found to experience hypoglycemia, only 2 were NPO when the drug was administered. Of the patients included in the study, 177 received some form of insulin therapy while receiving the other medication with 17 becoming hypoglycemic. Of the patients who experience hypoglycemia, 45.9% had received insulin concomitantly.
Conclusions: Hypoglycemia in patients taking either sulfonylureas or repaglinide is not a rare occurrence. Caution should be used when using these medications during inpatient admissions. The data from this study will be presented to the pharmacy and therapeutics with the proposal of removing sulfonylureas and repaglinide from the formulary.
Impact of pharmacist interventions on direct oral anticoagulant use prior to discharge

**Objectives:** The use of direct oral anticoagulants (DOACs) is expanding across health systems, as they are now recommended for several indications with a wide range of dosing regimens. DOACs do not require frequent laboratory monitoring, however there are potential concerns for prescribing errors and bleeding events. A previous study at Baystate Health (BH) identified gaps in essential monitoring services for patients discharged on DOACs, suggesting opportunities for improvement in the management of these patients. The goal of this quality improvement study is to determine the impact of pharmacists on DOAC use in patients prior to discharge and evaluate whether pharmacist interventions help reduce rates of inappropriate prescribing. We hope to demonstrate a need for pharmacist involvement in outpatient DOAC management at BH.

**Methods:** A retrospective chart review was conducted of 100 randomly selected patients who were newly prescribed a DOAC (apixaban or rivaroxaban) during an inpatient stay from 2018 to 2020. Patients were separated into two groups: those with pharmacist intervention on a DOAC order, and those without pharmacist intervention. Pharmacist intervention was identified using pre-specified criteria: presence of a documented “Rx Clinical Note” in the electronic medical record or an order modified, rejected, or placed by a pharmacist. Patient-specific data was collected including the DOAC prescribed, age, weight, renal function, and CHA2DS2VASc score. Our primary endpoint was the rate of inappropriate prescribing of DOACs prior to discharge. This was determined by reviewing the indication, dose, administration instructions, and presence of drug interactions. Appropriate prescribing was based on recommendations from package inserts. Our secondary endpoint was the rate of emergency department (ED) visits relating to the DOAC within 90 days post-discharge.

**Results:** Of the 100 patients, 48 had pharmacist intervention on their DOAC order, and 52 did not. The rate of inappropriately prescribed DOACs prior to discharge was lower in the pharmacist intervention group, 12.5% (n equals 6), compared to when a pharmacist did not intervene, 19.2% (n equals 10). Rates of ED readmissions relating to DOAC use were slightly decreased in the pharmacist intervention group (n equals 8) vs. those without pharmacist intervention (n equals 10). In a sub-group analysis of patients with pharmacist intervention, 81.3% (n equals 39) of interventions were accepted by the provider.
Conclusions: Patients who had a pharmacist intervene on their DOAC order prior to discharge had lower rates of inappropriate prescribing compared to those without pharmacist intervention. Integrating patients newly prescribed a DOAC into BH’s anticoagulation clinic could prevent continuation of inappropriate doses outpatient and decrease ED readmissions due to inappropriate prescribing, and overall increase the safety and quality of care for these patients.
Schucker, Heather

Enoxaparin 40 mg daily versus q12 for venous thromboembolism prophylaxis in morbidly obese medical patients

Objectives: Venous thromboembolism (VTE) is a major cause of in-hospital morbidity/mortality and obesity increases the incidence of VTE 6.2-fold. There is currently no data to support a specific dosing regimen in medical patients with a BMI over 40 kg/m2 as the doses being used in these patients are being extrapolated from studies in bariatric surgery patients. The objective of this study was to compare the safety and efficacy of enoxaparin 40 mg daily versus q12 in morbidly obese medical patients.

Methods: This was a single center, retrospective chart review conducted at Einstein Medical Center Philadelphia from July 2019 to March 2021. Patients were included if they were ≥ 18 years old, on a non-surgical service, had a BMI ≥ 40 kg/m2, and received enoxaparin 40 mg daily or q12. The primary efficacy endpoint was hospital-associated VTE (HA-VTE) rates and the primary safety endpoints were major and minor bleeding rates between both dosing regimens. Secondary endpoints included readmission for bleeding or VTE within three months. The sample size provides 80% power to detect a 90% reduction in risk, based on previous studies. Categorical variables were described using percentages and outcomes and compared using Fischer’s exact tests, Parametric continuous variables were described using means and compared using Student’s t tests, and Nonparametric continuous variables were described using medians and compared using Mann Whitney U tests.

Results: Of the 991 patients screened, 375 patients were included with 250 patients in the daily vs 125 in the q12 group. In this study, the incidence of HA-VTE was one in each group [1 (0.4%) vs 1 (0.8%) p=1.00]. There were no minor bleeding events in the daily group but there were 2 (1.6%) patients who experienced minor bleeding in the q12 group [0 (0%) vs 2 (1.6%), p=0.11]. There were no major bleeding events or readmissions within three months for VTE or bleeding in either group.

Conclusions: In this study, there were no significant differences in rates of thrombosis or major/minor bleeding between daily or q12 enoxaparin dosing in morbidly obese patients. However, this study was limited by a low baseline risk of VTE overall and a higher BMI in the q12 group. Further studies should be done in patients with a BMI over 40 kg/m2 and a high thromboembolic risk.
Title: Evaluation of nurse-driven unfractionated heparin nomogram in non-obese and obese patients

Objectives: Anticoagulation with weight-based unfractionated heparin (UFH) for the acute treatment of venous thromboembolism (VTE) in obese patients is a therapeutic challenge due to the drug's pharmacokinetics. As a result, the optimal dosing strategy for UFH in the obese population remains uncertain. This study aimed to evaluate the time to therapeutic activated partial thromboplastin time (aPTT) range in obese and non-obese patients and determine if institutional practice for dosing UFH is adequate in obese patients.

Methods: A retrospective chart review was performed of hospitalized patients admitted between August 2020 to August 2021 who received at least 24 hours of UFH infusion through the VTE nomogram order. The nomogram utilized actual body weight (ABW) for UFH dosing and a dose-capping strategy for obese patients. Key exclusion criteria included any deviations from the nomogram order, elevated or no baseline aPTT, and no documented VTE. The primary endpoint was the time to therapeutic aPTT in obese (weight >110 kg) versus non-obese (weight ≤110 kg) patients. Key secondary endpoints included time to two consecutive therapeutic aPTTs, percentage of patients with a first therapeutic aPTT within 24 hours of UFH initiation, and median UFH infusion rate required to attain first therapeutic aPTT and two consecutive therapeutic aPTTs. Safety outcomes included bleeding and thromboembolic events during hospitalization.

Results: A total of 200 patients were included, with 35 (18%) and 165 (82%) in the obese and non-obese cohorts, respectively. More patients in the obese group were male (71% versus 51%, p=0.017) and younger (53.3 versus 66.2 years, p<0.001). Median times to therapeutic aPTT in the obese and non-obese groups were 14.7 hours and 17.1 hours, respectively (p=0.294). Median times to two consecutive therapeutic aPTTs were 15.4 hours in the obese and 21 hours in the non-obese group (p=0.261). Within 24 hours, 27 (77%) in the obese group and 128 (78%) in the non-obese group had a first therapeutic aPTT (p=0.956). Mean heparin infusion rates (units/kg/hr) at first therapeutic aPTT (13.7 versus 15.2, p<0.001) and two consecutive therapeutic aPTTs (13.8 versus 15, p=0.002) were lower in the obese group.
compared to the non-obese group. There were no significant differences in bleeding or thromboembolic events between the two groups.

**Conclusions:** Our findings suggest that using ABW and dose caps for UFH dosing result in similar times to therapeutic aPTT in the obese and non-obese groups. However, obese patients may require lower weight-based infusion rates to reach therapeutic aPTT than non-obese patients. Large randomized clinical trials are needed to further investigate optimal dosing strategies in this patient population.
Implementation of an electrolyte repletion protocol for general medicine floors

Conference Abstracts
May 16-18, 2022

Presenter Name: Sieber, Rachel
Organization: Nuvance Health- Norwalk Hospital
Category: General Clinical Practice
Day | Session | Room | Time: Wednesday | 5 | Empire D | 1:45:00 PM

Authors: Amina Ramic, Rachel Sieber

Title: Implementation of an electrolyte repletion protocol for general medicine floors

Objectives: Electrolyte repletion is a common intervention required in the hospital setting. Intensive care units at many institutions benefit from the standardization of an electrolyte protocol. Repletion protocols have a substantial benefit on patient care, including maintaining normal electrolyte levels and decreasing the need for provider intervention. These considerations led to the inspiration and creation of an electrolyte repletion protocol for the general medicine floors at Norwalk Hospital.

Methods: This project involved two phases. Phase one included the creation of a protocol based on literature review and institutional operations. The success of the protocol also required a strategic plan to educate and promote awareness of the protocol. The second phase will include a retrospective analysis to compare the impact on electrolyte levels for patients treated using the protocol versus the provider specific approach. Both will be combined to analyze the effect that a standardized protocol has on guiding physicians to dose and monitor patients with hypokalemia, hypomagnesemia, and/or hypophosphatemia.

Results: The results of this project will focus on phase one of the methods. Based on literature research and Norwalk Hospital's ICU Electrolyte Repletion protocol, final recommendations were created for the protocol. The protocol was also developed based on the formulary options available and work flow procedures specific to Norwalk Hospital. The protocol was divided into repletion strategies for magnesium, potassium, and phosphate. A Med Electrolyte Repletion Powerplan on the Cerner EMR was created in collaboration with the informatics team and a go-live date of December 13, 2021 was established. Communication challenges and a lack of utilization was evident post implementation. Network wide emails were delivered, education was provided to the current medical residents, and the protocol was presented to network committees in order to increase awareness of the protocol. In addition, the informatics team created a suggested plan via EMR advanced technology to direct providers to the Powerplan when placing an electrolyte order. These strategies had a direct impact on the awareness of the protocol and increased utilization.

Conclusions: The implementation of an electrolyte repletion protocol required multiple steps for completion. The creation of a successful protocol required strategic planning and research. Effective communication and collaboration with multiple departments was also necessary to
optimize protocol utilization. Phase two of the project will provide validation of benefits with future analysis. Phase two will begin in the fall pending data collection from current practice. The results of the retrospective analysis are anticipated in December 2022.
Assessment of pharmacologic venous thromboembolism prophylaxis in patients with indwelling neuraxial catheters

**Objectives:** Venous thromboembolism (VTE) is an important and frequently hospital-acquired condition associated with significant morbidity and mortality. Patients who require neuraxial analgesia are considered to be at high risk for VTE due to the degree of their immobility and frequent association with recent surgical procedures. Despite their high VTE risk, use of anticoagulation in these patients is controversial and challenging to manage, even at prophylactic doses, due to the risk of spinal hematoma. Prevention of spinal hematoma requires careful timing of VTE prophylaxis doses surrounding catheter manipulation. The purpose of this study is to characterize institutional practices surrounding VTE prophylaxis in patients who have indwelling neuraxial catheters and to describe rates of VTE and spinal hematoma events in this patient population.

**Methods:** This was a multi-site, single-health system, retrospective, observational cohort study. Patients were included if they were ≥ 18 years old and underwent neuraxial catheter placement while admitted to The Johns Hopkins Hospital or Johns Hopkins Bayview Medical Center between July 2019 and August 2021. Patients were excluded if they had a hospital length of stay less than 72 hours or if they were admitted to a Labor & Delivery Unit. VTE prophylaxis orders immediately preceding, during, and immediately following neuraxial catheter placement will be evaluated for adherence to institutional guidelines, as well as number of missed doses. Clinical outcomes include new VTE and spinal hematoma.

**Results:** Characteristics of pharmacologic VTE prophylaxis prescribing and administration patterns will be recorded and presented including rates of missed doses of pharmacologic VTE prophylaxis, adherence to institutional guidelines regarding agents used, doses, and timing of administration surrounding neuraxial catheter manipulation, VTE events during admission and within 30 days of catheter insertion, and spinal hematoma incidence.

**Conclusions:** It is anticipated that this project will demonstrate that select patients with indwelling neuraxial catheters have missed doses of VTE prophylaxis surrounding times of catheter manipulation. It is also anticipated that adherence to institutional guidelines regarding agent and dose of anticoagulant is high, and the rate of spinal hematoma is low.
Tobin, Sarah

Evaluation of inhaler prescribing patterns at discharge in patients with chronic obstructive pulmonary disorder exacerbations after pharmacy-led provider education in a community hospital

Conference Abstracts
May 16-18, 2022

Presenter Name: Tobin, Sarah
Organization: Penn Medicine Princeton Medical Center, Plainsboro, New Jersey
Category: General Clinical Practice
Day | Session | Room | Time: Wednesday | 5 | Empire D | 12:30:00 PM

Authors: S. Tobin, PharmD; P. Coco, PharmD, BCPS

Title: Evaluation of inhaler prescribing patterns at discharge in patients with chronic obstructive pulmonary disorder exacerbations after pharmacy-led provider education in a community hospital

Objectives: The Global Initiative for Chronic Obstructive Lung Disease (GOLD) guidelines recommend that patients with COPD with a history of exacerbation be on a long acting maintenance inhaler to prevent recurrence. There is significant evidence to support long-acting antimuscarinic antagonists (LAMAs) as the drug of choice in prevention of COPD exacerbations. The objective of the study is to determine if pharmacy-led provider education regarding GOLD guideline-directed therapy for patients with COPD exacerbations changes prescribing patterns on discharge.

Methods: The intended research is a twofold retrospective chart review. The first leg of chart review included participants treated for a COPD exacerbation from 6/1/2019 to 6/31/2021. Participants were identified utilizing ICD codes and their charts reviewed to evaluate if they were discharged on guideline directed therapy. Next, hospitalists and medical residents received education about guideline recommendations for treatment of COPD exacerbation as well as results from the initial chart review. Finally, a second chart review will take place from 1/17/2022 – 4/4/2022 using the same methods as the initial review. The primary endpoint is to describe the difference in prescribing patterns of patients being treated for COPD exacerbations on discharge before and after provider education. The secondary endpoints are to determine the percentage of patients being discharged on a LAMA and inhaled corticosteroids (ICS), as well as to determine if provider education changes prescribing patterns on discharge. This study was approved by the Penn Medicine Princeton Medical Center IRB.

Results: Interim analysis results of the initial chart review demonstrated that patients were most frequently admitted and discharged on therapy containing long-acting therapy with ICS. Additionally, 55% of the time participants were discharged on a LAMA and about 10% of the time the LAMA was added on discharge by the treating team. The number and percentage of patients discharged on a LAMA and/or ICS after provider education will be reported and compared to results prior to provider education.
Conclusions: It is anticipated that the project will show an increase in patients being discharged home on GOLD guideline directed therapy after provider education compared to patients from the initial retrospective review prior to education.
Presenter Name: Uricher, Sarah
Organization: RWJBarnabas Health Monmouth Medical Center
Category: General Clinical Practice
Day | Session | Room | Time: Tuesday | 3 | Magnolia A | 12:15:00 PM

Authors: S. Uricher, G. Fahim, J. Saleh, H. Lee Ghin, A.S. Mathis

Title: Prospective analysis of a pharmacy-driven intravenous levothyroxine stewardship program

Objectives: Levothyroxine’s extended half-life of 6-7 days is advantageous in the treatment of patients with nil per os (NPO) status as it suggests that patients with the short-term inability to tolerate enteral medications may not require intravenous (IV) administrations in the inpatient setting. Our institution implemented a pharmacy-driven IV levothyroxine stewardship program designed to optimize medication use by reducing unnecessary administrations.

Methods: This was a single center, prospective cohort study where the primary endpoint of the study was to evaluate the impact of a pharmacy-driven IV levothyroxine hold protocol. The study was designed to be conducted in two phases. The pre-implementation phase consisted of a retrospective chart review that identified patients who met study inclusion criteria to assess the hospital's current usage of IV levothyroxine. The post-implementation phase consisted of a prospective analysis of a pharmacy-driven hold protocol to optimize IV levothyroxine usage. The following data points were collected for analysis: patient demographics, outpatient oral levothyroxine dose, IV levothyroxine dose ordered, appropriateness of dosing conversion, number of IV levothyroxine doses administered, number of intravenous levothyroxine vials used, ordering service, and levothyroxine therapy indication.

Results: The percentage of adherence to the hold protocol and the number of IV levothyroxine administrations prevented will be presented.

Conclusions: It is anticipated that this study will demonstrate optimized IV levothyroxine usage and an associated cost savings as a result of the pharmacy-driven stewardship program.
ASHP Abstract: Evaluation of Inpatient Glycemic Control Pre- and Post-Implementation of a Hemoglobin A1c (HbA1c) Testing Protocol in a Small Community Hospital

Objectives: The Joint Commission recommends obtaining an HbA1c during admission unless available within the past three months; or a comorbid condition or therapy is present that would confound results. Currently, South County Hospital (SCH) does not consistently determine HbA1c for patients, which may impact trajectory of care and affect patient outcomes. High HbA1c values are associated with poor clinical outcomes in hospitalized patients and have been shown to be useful for estimating hypoglycemia risk, defining insulin prescribing, and tailoring discharge regimens. This study will compare glycemic control in patients with diabetes admitted pre- and post-implementation of an HbA1c testing protocol.

Methods: A retrospective cohort analysis of inpatient glycemic control in patients with diabetes admitted to the hospital pre- and post-implementation of a pharmacist-guided HbA1c testing protocol will be conducted. Patients will be reviewed retrospectively between July 1, 2021 until January 9, 2022 prior to implementing the new HbA1c testing protocol. After implementation, admitted patients with diabetes will be compared to those admitted prior to the intervention. Data to be collected from the Electronic Medical Record (EMR) includes patient age, gender, weight, diabetes status (type 1 or type 2), pre-admission diabetes regimen, HbA1c, blood glucose readings, length of stay, and reason for admission. The primary endpoint is average daily blood glucose during hospital stay pre- and post-intervention. Additionally, blood glucose on admission, maximum glucose during stay, number of hypo- and/or hyperglycemic events, proportion of blood glucose measurements in range, blood glucose average standard deviation, and average length of stay will be evaluated. This study was submitted and approved by the SCH Institutional Review Board.

Results: The data pre- and post-intervention will be collected, analyzed, and presented at the completion of the study. ANOVA will be used to compare glycemic measurements for each group.

Conclusions: It is anticipated that this project will provide insight into provider utilization of HbA1c values for inpatient diabetes regimen titration and improve consistency of ordering HbA1c values on admission in accordance with Joint Commission recommendations through a pharmacist-driven process.
**Conference Abstracts**  
*May 16-18, 2022*

**Presenter Name:** Youssef, Marina  
**Organization:** Nazareth Hospital  
**Category:** General Clinical Practice  
**Day | Session | Room | Time:** Monday | 1 | Empire D | 12:15:00 PM

**Authors:** Marina Youssef  

**Title:** Evaluating the Impact of a Multidisciplinary Approach to Status Epilepticus Management Using Hospital Approved Guidelines  

**Objectives:** The purpose of this research is to assess whether patients in a community teaching hospital are being treated appropriately for management of status epilepticus according to hospital-approved guidelines. Status epilepticus is a medical emergency in which swift intervention critically determines patient outcomes. Suboptimal dosing of first and second-line agents is an ongoing crisis which impacts the level of brain damage and recovery time of the patient.

**Methods:** Retrospective study included analysis of patient charts over 9 months beginning January 2021 examined use of benzodiazepines as first line agents for the treatment of convulsive status epilepticus in addition to use of second line agents used to prevent recurring seizures. Prospective analysis followed retrospective study after a brief pause of chart review to allow time for educational sessions and implementation of interventions. Hospital approved guidelines of management of status epilepticus were used as a guide for determination of appropriate management. The electronic medical record system was used to determine what choice of agents were used as well as the dose and frequency and in what order the agents were administered.

**Results:** The number and percentage of treatments that deviated from the hospital-approved guidelines for status epilepticus will be recorded and the results will be presented.

**Conclusions:** It is anticipated that this project will demonstrate a role for pharmacist-based patient interventions to increase awareness and adherence to hospital-approved guidelines in the treatment of status epilepticus to further improve patient outcomes.
Conference Abstracts
May 16-18, 2022

Presenter Name: PharmD, Selina Muhn
Organization: Tabula Rasa Healthcare
Category: Geriatrics/Long Term Care
Day | Session | Room | Time: Tuesday | 4 | Empire B | 3:45:00 PM

Authors: S. Muhn, D. Bankes, J. Turgeon, C. Bardolia, N.S. Amin; Tabula Rasa HealthCare, Moorestown, New Jersey

Title: Pharmacists' Impact on Drug Expenditure in the Program of All-inclusive Care for the Elderly (PACE)

Objectives: a) To evaluate the impact of pharmacists' interventions on medication costs and b) to quantitatively describe the interventions made for medically complex, community-dwelling older adults.

Methods: We examined ingredient costs, six months before and after cost-relevant interventions (CRI) that occurred between January and July of 2020. Deprescribing and/or cost-specific interventions were considered CRI. Subjects were categorized into naturalistic treatment and control groups. The treatment group included patients who implemented interventions, whereas the control group included patients whose interventions were not implemented. Using a series of quantile regressions, we compared post-intervention medication costs between groups, while adjusting for several covariates. Additionally, we assessed intervention subtypes by frequency, implementation rate, and association with a ≥10% cost decrease.

Results: The interim analysis included 613 participants (mean age: 74.0 ± 9.6 years, 70.8% female). For all percentiles between the 15th and 80th percentiles, post-intervention medication costs were lower in the treatment group (n = 277) compared to the control group (n = 336) (median difference: $639/patient, 99.9% CI: [$224 - $1104]; P<0.001). While 70.0% (n=606/866) of CRIs targeted deprescribing, cost-specific CRIs were more likely to be implemented (55.8% [n=145] vs. 33.5% [n=203], P<0.001) and to result in a ≥10% decline in costs, if implemented (OR=2.18, 90% CI [1.44 - 3.32]). Compared to all other classes, ophthalmic medications and antihyperglycemics had the highest implementation rates (56% and 53%, respectively), and were most likely to obtain ≥10% decline in medication costs (OR=1.6, 90% CI [1.02 - 2.53] and OR=2.94, 90% CI [1.61 - 5.62]).

Conclusions: Implementing pharmacists' CRIs was associated with a decrease in medication expenditure. Particularly, implementing CRIs targeting ophthalmic and antihyperglycemic medications were most likely to reduce medication costs by ≥10%.
Conference Abstracts
May 16-18, 2022

Presenter Name: Preiserowicz, Rochel
Organization: James J. Peters VA Medical Center
Category: Geriatrics/Long Term Care
Day | Session | Room | Time: Tuesday | 4 | Empire B | 3:30:00 PM

Authors: Rochel Preiserowicz, BS, BPS, PharmD, Noor Fattouh, PharmD, BCGP, Troy Kish, PharmD, BCPS

Title: Frequency of intervention for lower extremity edema from dihydropyridine calcium channel blockers

Objectives: Approximately 116 million individuals, nearly half of adults in the United States, are diagnosed with hypertension. The class of dihydropyridine calcium channel blockers (DHP CCB), such as amlodipine and nifedipine extended release (ER), are particularly useful in the management of hypertension because they do not require routine electrolyte monitoring or cause hypovolemia. However, a side effect to DHP CCBs is the potential to cause lower extremity edema (LEE), which can lead to discontinuation of therapy. There are several strategies utilized to reduce edema, such as decreasing the dose of DHP CCB, trialing an alternative CCB, or discontinuing it altogether. The development of edema is non-specific and may not be recognized as a side effect, which can potentially lead to the initiation of a loop diuretic to offset edema. There is little data assessing whether there is a higher incidence of edema in amlodipine or nifedipine use. The primary objective of this study is to determine the incidence of DHP CCB-induced edema following amlodipine versus nifedipine initiation.

Methods: This is a retrospective chart review of the computerized patient record system (CPRS) to assess frequency of LEE following amlodipine versus nifedipine therapy. Incidence of LEE was identified by either initiation of a loop diuretic in the 12 months following amlodipine or nifedipine initiation, or discontinuation, dose decrease, or switch of DHP CCB due to edema in the study timeframe. Individuals were included if they were 18 years and older, newly initiated on amlodipine or nifedipine ER between October 1, 2019 to February 28, 2021, and either newly initiated on a loop diuretic within 12 months following amlodipine or nifedipine ER initiation, switched from one of the study DHP CCBs to the other, decreased dose of DHP CCB, or discontinued study DHP CCB due to edema within the study timeframe. Individuals were excluded if they had congestive heart failure and/or end stage kidney disease. Patient characteristics, treatment-specific parameters, and study outcomes will be analyzed using descriptive statistics.

Results: The frequency of intervention for lower extremity edema from amlodipine versus nifedipine ER use will be recorded and results will be presented.

Conclusions: The conclusion of this research is pending and will be presented.
Conference Abstracts
May 16-18, 2022

Presenter Name: Russell, Joshua
Organization: 1Office of Translational Research and Residency Programs, Tabula Rasa HealthCare, NJ, USA 2Precision
Category: Geriatrics/Long Term Care
Day | Session | Room | Time: Poster

Authors: Russell J1, Arwood MJ2, Matos A1, Del Toro-Pagan NM1, Amin NS1, Turgeon J 1,2,3, Michaud V2,3

Title: Retrospective study assessing a pharmacist-led pharmacogenomics service in the elderly: test results, drug-induced phenoconversion, and clinical recommendations

Objectives: For patients with polypharmacy, a medication safety review service by Tabula Rasa HealthCare provides comprehensive reviews of current medications and future treatment plans to mitigate adverse drug events (ADEs) associated with complex drug regimens. Pharmacogenomics (PGx) may further optimize the identification and resolution of medication-related problems. The clinical utility of PGx information incorporated into an evidence-based clinical decision support system (CDSS) in the Program of All-Inclusive Care for the Elderly (PACE) has not been fully evaluated. This retrospective study aims to assess the recent landscape of PGx results when combined with drug-induced phenoconversion (PC) in a PACE setting and to describe pharmacists PGx recommendations (REC), prescribers' acceptance, and change in medication risk score (MRS).

Methods: Patients enrolled in a PACE program who received PGx testing between January and May 2021 were included. A CDSS was used to identify drug-gene (DGIs), and drug-drug-gene (DDGIs) interactions due to drug-induced PC. The following data were extracted: medications; CYP2C19, CYP2C9, CYP2D6, CYP3A5, and SLCO1B1 genotypes, phenotypes, actionable genotypes, DGIs, DDGIs, and drug-induced PC; PGx-focused REC; implementation of REC; and MRS (pre/post PGx REC).

Results: A total of 113 patients met inclusion criteria. Data analysis is ongoing, having been completed for 83 patients (73%) to date. Preliminary findings showed that, on average, patients were taking 4.6 genotype-guided medications. Over 95% of patients had at least one actionable genotype. CYP2C19 and CYP2D6 had the highest frequency of DGIs, 1.06 and 0.95 per patient, respectively. Accounting for interacting medications in those with DGIs (79), potential PC was observed in 39%, 17%, and 6% patients at CYP2D6 (n=31), CYP2C19 (n=14), and CYP2C9 (n=5), respectively. The number of patients with a potential poor metabolizer (PM) due to PC was 3.8-, 9-, and 4-fold higher compared to the PM predicted by the CYP2D6, CYP2C19, and CYP2C9 genotype, respectively. A total of 81% (67/83) of patients was included in the REC/implementation analysis. For these 83 patients, pharmacists have made 149 REC, of
which 67.8% have been accepted by providers. On average, the PGx-REC implementer group had a 1.4-point reduction in MRS.

**Conclusions:** Our preliminary findings highlight the high prevalence of DGIs and DDGIs in PACE patients. Our results showed that using a CDSS, PGx-focused interventions led to a reduction in MRS suggesting reduction in ADEs, hospitalizations and death. Our findings support utilization of a CDSS integrating PGx and drug-induced PC to optimize medication regimens and improve medication safety.
Conference Abstracts
May 16-18, 2022

Presenter Name: Ye, Xiao Qing
Organization: VA Maryland Health Care System
Category: Geriatrics/Long Term Care
Day | Session | Room | Time: Tuesday | 4 | Empire B | 4:00:00 PM

Authors: Xiao Ye PharmD, Stephanie Ozalas PharmD, BCPS, BCGP

Title: Evaluation and optimization of VIONE implementation strategies in a Veterans Affairs long-term care setting

Objectives: VIONE is an evidence-based Veterans Affairs (VA) deprescribing tool that provides a methodological approach to address polypharmacy. In January 2020, the Loch Raven Community Living Center (LR CLC) in the VA Maryland Health Care System (VAMHCS) implemented VIONE. However, VIONE was not fully implemented due to challenges with interdisciplinary care during a national pandemic. Thus, the purpose of this study is to evaluate the effect of current VIONE practice and to optimize VIONE implementation in the LR CLC of VAMHCS.

Methods: Charts were reviewed for LR CLC veterans with VIONE-related medication changes/discontinuations between January 2020 to June 2021, excluding those with a length of stay (LOS) of less than seven months in the LR CLC. Data including baseline demographics was collected per fiscal year. Primary outcome was rate of successful VIONE deprescription. Secondary outcomes include number of VIONE notes completed, number of patients with successful VIONE deprescription, reason for deprescription, type of medication deprescribed, and adverse events in those with deprescribing failure. The service implementation phase include interventions, such as interdisciplinary team education, VIONE review during medical rounds, and care plan documentation. Statistical analysis will be using Kruskal-Wallace test, Student's t-test, chi-square test, and descriptive statistics.

Results: The rates of successful deprescription per fiscal year quarter were 74% (Jan-Mar 2020), 90% (Apr-Jun 2020), 86% (Jul-Sep 2020), 80% (Oct-Dec 2020), 55% (Jan-Mar 2021), and 78% (Apr-Jun 2021) respectively with overall rate of 77%. Use of VIONE led to successful deprescription of 144 medications over 18 months. The most common reason for deprescription was not indicated/treatment completed (37%), followed by discontinue/alternative medication (35%). Most common type of medications deprescribed was GI agents like laxatives, PPIs (19%). Overall completion rate of VIONE note was low (22%). There were no adverse reactions associated with any deprescription failure, most medications with deprescribing failure were restarted as part of their discharge medications from hospitalization.

Conclusions: Overall, implementation of VIONE deprescription remained consistent and was mostly successful throughout the pandemic. VIONE deprescription was least successful in Jan-
Mar 2021 likely due to peak of pandemic and higher rate of veterans hospitalized for acute illness. Provider reported VIONE note template was cumbersome and not user-friendly, which likely resulted low VIONE note completion. These findings provided progress on VIONE implementation in LR CLC while identifying opportunities to further optimize the VIONE implementation practice in LR CLC as well as VAMHCS overall.
Conference Abstracts  
May 16-18, 2022

Presenter Name: Abdelsayed, Sandi  
Organization: Hackensack Mountainside Medical Center 
Category: Infectious Diseases  
Day | Session | Room | Time: Wednesday | 6 | Empire C | 2:45:00 PM

Authors: Sandi Abdelsayed PharmD, Ahmed Selevany PharmD BCPS, Richard Adamczyk PharmD, Valerie Allusson, M.D., SFHM, MMM, FACP, CHCQM, CPE

Title: Retrospective review of vancomycin loading dose in methicillin resistant staphylococcus aureus positive septic patients

Objectives: Surviving Sepsis Campaign guidelines suggest a vancomycin loading dose of 25-30 mg/kg, initial dosing in the emergency department is often a 1 gram dose regardless of weight. This retrospective study aims to analyze what effect, if any, a vancomycin loading dose given in the emergency department will have on survival to hospital discharge in MRSA positive septic patients.

Methods: A retrospective chart review will be conducted by trained study data abstractors. In order to ensure inter-rater reliability, at minimum 2 data abstractors will perform data collection using a specific data collection form that defines the data points that need to be collected and where in the medical record this information will be extracted. All computer data entry will be done using the assigned study identification number only. Patients were assigned into two groups: weight based (15-30 mg/kg) vs non-weight based dosing. Patients eighteen years and older with positive MRSA culture treated with vancomycin who had at least one true trough were included. The primary outcome is to evaluate the loading dose of vancomycin given in the emergency department to MRSA positive septic patients and its effect on survival to hospital discharge. Secondary outcomes included time to vancomycin therapeutic trough and incidence of nephrotoxicity.

Results: Patients diagnosed with MRSA positive sepsis treated with vancomycin from April 1st 2019 to January 1st, 2022 were included. All statistical tests were performed with 2-tailed P < 0.05 indicating statistical significance. A total of 160 patients were identified in this time frame, of which 46 met inclusion criteria. The groups of patients were equally matched (no statistically significant differences were noted). No statistically significant difference on survival to hospital discharge (p=0.58), nephrotoxicity (p=0.92), or time to therapeutic trough (p=0.08) was noted.

Conclusions: The results from this retrospective analysis of MRSA positive septic patients treated with vancomycin demonstrated no statistical significance between weight-based and non-weight based loading doses on survival to hospital discharge. The findings also suggest that vancomycin loading doses do not increase nephrotoxicity. Future studies are needed to confirm these findings.
Aminoglycosides in Grade III Open Fractures: Infection Rates, Outcomes and Assessment of Common Practice

Objectives: Grade III open fractures are a rare complication of high-energy injuries, such as motor vehicle accidents, leading to the communication of the fracture and the outside environment. Given the nature of these injuries, current guidelines recommend antibiotic prophylaxis with the use of a first-generation cephalosporin; however, the routine use of gram-negative coverage remains widely debated. Much of the data for routine gram-negative coverage, traditionally accomplished with an aminoglycoside, relies on early work from the 1970’s with antibiotic resistance profiles that may no longer be reflective of current susceptibility trends. The objective of this study is to compare key outcomes for patients with grade III open fractures, such as infection rates, acute kidney injury and need for renal replacement therapy in patients treated with an aminoglycoside when compared to those that received an aminoglycoside-sparing regimen.

Methods: This is an IRB-approved multi-center retrospective chart review of patients admitted with a primary diagnosis of grade III open fracture within a healthcare network. Historical chart review from adult patients admitted from August 20th, 2016 to March 15th, 2022 was conducted to assess system-wide antibiotic prophylaxis practices. Patients were excluded from the study if they received antibiotics for an indication other than prophylaxis in the setting of grade III open fractures. The primary endpoint of the study is 30-day injury site infections. Key secondary endpoints, including the development of AKI, as defined as an increase in serum creatinine over 1.5x baseline or a decrease in eGFR by greater than 25%, receipt of renal replacement therapy, and the rate of gram-negative infections were assessed. Findings from this retrospective chart review will be utilized to identify potential opportunities for provider education and changes to future open fracture protocols.

Results: Results regarding the incidence of infection, acute kidney injury, receipt of renal replacement therapy, illness severity scores on admission, as well as both concomitant nephrotoxic agents, and antibiotics will be presented.

Conclusions: This study aims to review 200 trauma patients to investigate the institution’s use of antibiotic prophylaxis in the setting of grade III open fractures. The authors hypothesize that
patients receiving an aminoglycoside in addition to a first-generation cephalosporin will have lower rates of 30-day injury site infections and higher rates of acute kidney injury when compared to patients receiving first-generation cephalosporin monotherapy.
**Impact of pharmacist and provider education on antibiotic de-escalation in community-acquired and hospital-acquired pneumonia**

**Objectives:**
The use of broad-spectrum antibiotics should be reserved for certain patients with risk factors for infections due to antibiotic-resistant organisms such as methicillin-resistant Staphylococcus aureus (MRSA) or Pseudomonas. Antibiotic de-escalation is a key element of antimicrobial stewardship to help minimize the overuse of broad-spectrum antibiotics. Providing education to pharmacists and healthcare providers about prescribing trends and recommendations regarding when de-escalation may be appropriate is an important part of a successful antimicrobial stewardship program. The primary outcome of this study is the rate of antibiotic de-escalation in patients with pneumonia at Elliot Hospital, defined as narrowing antibiotic therapy, or conversion from IV to PO antibiotics, pre- and post-education regarding antibiotic de-escalation. Secondary outcomes include duration of antibiotic therapy, length of stay, and mortality.

**Methods:**
Data for this retrospective cohort study was collected from August 1st, 2021 to November 13th, 2021. Patients included were 18 years or older and admitted to Elliot Hospital with a diagnosis of pneumonia who received broad spectrum empiric antibiotics, specifically vancomycin and piperacillin/tazobactam, post-admission. Education was provided to pharmacists and providers in January 2022 regarding rates of de-escalation at Elliot Hospital, as well as guideline recommendations for use of broad-spectrum antibiotics in pneumonia and when de-escalation is appropriate. Post-intervention data will be collected from February 3rd, 2022 to April 1st, 2022 to assess the impact of the education.

**Results:**
Prior to pharmacist and provider education, the mean rate of antibiotic de-escalation (defined as having both vancomycin and piperacillin/tazobactam de-escalated) by day 4 of therapy in patients treated for community-acquired and hospital-acquired pneumonia was 26.7% and 35.7%, respectively. For patients with community-acquired pneumonia, antibiotic de-escalation was associated with a reduction in duration of antibiotic therapy by 2.2 days, and a reduction in length of stay by 3 days. There was not a significant reduction in duration of antibiotic therapy for patients being treated for hospital-acquired pneumonia. De-escalation was not associated with an increased risk of mortality in either group. Post-intervention data will be collected and presented.
Conclusions: It is anticipated that pharmacist and provider education on antibiotic de-escalation in community-acquired and hospital-acquired pneumonia will increase the rate of antibiotic de-escalation and result in reduced duration of antibiotic therapy and length of stay.
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Presenter Name: Alabbasi, Afaq
Organization: Steward St. Elizabeth's Medical Center
Category: Infectious Diseases
Day | Session | Room | Time: Wednesday | 6 | Empire C | 4:00:00 PM

Authors: Afaq Alabbasi, PharmD; Salwa Elarabi, R.Ph. BCPS-AQ Infectious Diseases

Title: Implementation of pharmacists’ electronic feedback note to improve antimicrobial stewardship program

Objectives: The Centers for Disease Control and Prevention (CDC) Core Elements of Hospital Antibiotic Stewardship Programs (ASP) guideline states 30% of antibiotics initiated at United States hospitals are inconsistent with guidelines recommendations. Inappropriate antibiotic use increases the risk of adverse events, antibiotic resistance, and healthcare associated cost. Prospective audit and feedback and preauthorization are key ASP core elements recommended by the CDC to improve antibiotic use. However, consistent feedback to practitioners regarding appropriate antimicrobial selection could be a challenge.

Methods: This quality improvement project involved implementing a written antimicrobial stewardship (AMS) feedback note in the electronic medical record (EMR) by the Infectious Disease (ID) Pharmacist. The feedback note was utilized to include recommendations to optimize utilization of the selected antibiotics (vancomycin, cefepime, meropenem, piperacillin/tazobactam). The project aim was ≥ 30% of selected antimicrobial interventions made by ID Pharmacist through an EMR note will be accepted in ≤ 48 hours of note initiation by March 4th, 2022. The outcome measure was the percentage of accepted interventions made by ID Pharmacist on weekdays. Process measures included Days of therapy (DOT)/1000 days for each antibiotic, time (in hours) to accept pharmacist recommendations and number of each intervention type. Balancing measure was the average time spent by ID Pharmacist reviewing patient chart and documenting AMS feedback note.

Results: Between October 4th, 2021 until March 4th 2022, ID Pharmacist evaluated 193 patients who were initiated on one or more of the selected antimicrobials and wrote AMS feedback note with recommendations. The percentage of interventions accepted per week ranged between 80% to 100% with a mean of 95%. A total of 102 interventions were accepted by primary team. Examples of interventions included antibiotic de-escalation and duration of therapy. DOT/1000 days was trending down for vancomycin and cefepime. The average time to accept ID Pharmacist recommendations was 4 hours. The average time spent by ID Pharmacist reviewing patient chart and documenting AMS feedback note was 15 minutes.

Conclusions: From the implementation of the project until March 4th, 2022, ID Pharmacist interventions through AMS feedback note were highly accepted. This resulted in an overall
improvement in antimicrobials utilization including de-escalation and appropriate duration of therapy. Future Plan-Do-Study-Act cycles to create AMS note for all restricted antimicrobials could further enhance our institution's ASP.
**Presenter Name:** Bailey, Shannon  
**Organization:** Northern Light Eastern Maine Medical Center  
**Category:** Infectious Diseases  
**Day | Session | Room | Time:** Tuesday | 3 | Magnolia C | 12:30:00 PM

**Authors:** S. Bailey, H. Sherman, K. Massey, K. Sawyer; Northern Light Eastern Maine Medical Center, Bangor, Maine

**Title:** Risk of acute kidney injury in hospitalized patients receiving combination therapy with vancomycin and gentamicin

**Objectives:** The 2015 IDSA/AHA guidelines for the treatment of infective endocarditis (IE) recommend combination vancomycin-gentamicin synergism for staphylococcal prosthetic-valve IE, and enterococcal IE in patients unable to tolerate beta-lactam antibiotics. Acute kidney injury (AKI) occurs in 4.4% to 35% of patients receiving combination therapy and has been associated with increased length of stay and mortality. Currently, there are no studies in this population describing the risk factors for AKI to help identify which patients receiving combination therapy may be at higher risk of experience adverse renal outcomes.

**Methods:** We conducted a multicenter, retrospective case-control study from January 2012 to September 2020. Inpatients ages 18 years and older were included if they received combination therapy for at least 24 hours. Cases were defined as patients who developed AKI per 2012 KDIGO criteria during combination therapy through 5-days post-discontinuation. Controls were defined as patients who did not develop AKI during the exposure period. The primary outcome was identification of risk factors associated with the development of an AKI, which was analyzed utilizing Fisher's exact tests and unpaired t-tests.

**Results:** 40 patients were identified, 12 (30 %) cases and 28 (70 %) controls. The duration of combination therapy was longer for cases (6.1 days vs. 2.6 days, p < 0.01). Cases had a longer average duration of concomitant nephrotoxin use (4.5 days vs. 2.9 days, p = 0.3). The mean vancomycin trough was 21.3 mcg/mL for cases, and 17.8 mcg/mL for controls (p = 0.11).

**Conclusions:** Increased duration of combination therapy was associated with the development of AKI. Cases had a numerically longer duration of concomitant nephrotoxins and higher vancomycin trough levels. Larger sample sizes are needed to better elucidate specific risk factors, nonetheless, this study highlights the risk of AKI in patients receiving vancomycin and gentamicin combination therapy.
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Presenter Name: Bailey, Tyler
Organization: MaineGeneral Medical Center
Category: Infectious Diseases
Day | Session | Room | Time: Wednesday | 5 | Magnolia B | 1:15:00 PM

Authors: Tyler Bailey, PharmD, Rachael Elias, PharmD; Ellie Provisor, PharmD; John Carson, MD, RPVI

Title: Evaluation of guideline directed therapy for antibiotic prophylaxis in vascular surgery

Objectives: Surgical site infections (SSIs) are rare but often serious complications of vascular surgery. Antibiotic prophylaxis plays an important role in the prevention of SSIs for certain vascular procedures. Antibiotic prophylaxis is indicated for vascular procedures demonstrating a high risk of infection, such as aneurysm repair, thromboendarterectomy, vein bypass, and procedures involving an implant. To optimize antibiotic prophylaxis in vascular surgery, a standardized protocol was created which incorporates institutional resistance patterns and antibiotic stewardship principles. The objective of this study is to assess the impact of a standardized protocol for antibiotic prophylaxis in vascular surgery.

Methods: This study was submitted to the Institutional Review Board for approval. A single-center retrospective analysis will be conducted from 2/1/21 – 1/31/22 and prospective analysis from 2/1/22 – 3/31/22 for patients that underwent a procedure by the MaineGeneral Medical Center vascular team. Procedures included bypass, any femoral endarterectomy, or any aortic aneurysm repair. Data points collected include Hgb A1C, glucose, BMI, ABI, smoking history, dialysis, MRSA history, β-lactam allergy, negative pressure vacuum dressing, timing of antibiotic dose vs incision, re-dosing, procedure time, and outpatient vs inpatient cases. The primary objective is to evaluate the change in proportion of patients classified as high MRSA risk receiving vancomycin vs clindamycin, and those with groin/abdominal incision with adequate gram negative coverage. Secondary objectives include SSI rate, patient characteristics of SSIs, duration of antibiotic use, and appropriate re-dosing of antibiotics.

Results: N/A

Conclusions: N/A
Conference Abstracts
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Presenter Name: Belfiore, Gina
Organization: The Unity Hospital of Rochester
Category: Infectious Diseases
Day | Session | Room | Time: Tuesday | 4 | Magnolia A | 3:00:00 PM

Authors: G. Belfiore, PharmD. R. Guida, PharmD. BCPS

Title: Evaluation of baricitinib or tocilizumab therapy on mortality in COVID-19 patients at a community teaching hospital

Objectives: Baricitinib and tocilizumab are both approved treatments for COVID-19 under the emergency use authorization by the FDA. Baricitinib has been approved for treatment of suspected or confirmed COVID-19 hospitalized patients requiring supplemental oxygen, invasive mechanical ventilation, or extracorporeal membrane oxygenation. Tocilizumab has been approved for the treatment of COVID-19 in hospitalized patients who are receiving systemic corticosteroids; require supplemental oxygen, non-invasive or invasive mechanical ventilation, or extracorporeal membrane oxygenation. While both of these agents have shown benefit in the treatment of COVID-19, one is not recommended over the other, as there are no studies that directly compare the two agents. The purpose of this study is to evaluate outcomes with baricitinib or tocilizumab therapy for COVID-19 patients at Unity Hospital in Rochester, NY.

Methods: A single-center, retrospective, chart review was conducted for three-month time periods for each treatment. Patients were excluded if younger than 18 years of age or if received less than three doses of baricitinib. Each patient chart was evaluated for mortality within 28 days upon start of treatment, rate of intubation, length of stay, and if discharged within 28 days of treatment. Each patient chart was also assessed on COVID-19 vaccination status.

Results: The mortality of patient's receiving each treatment will be recorded and presented. The rate of intubation, length of stay, discharge within 28 days, and vaccination status will also be recorded and presented.

Conclusions: It is anticipated that this study will demonstrate a comparison of COVID-19 treatments and benefit on mortality. Overall, the two treatment agents are anticipated to have similar mortality rates.
Admission rates post administration of monoclonal antibodies for COVID-19

**Objectives:** Patients with underlying health conditions are at increased risk for progression to severe coronavirus disease. When compared to vaccine-derived immunity, which builds over time, monoclonal antibodies provide rapid, passive immunity and may reduce disease progression and complications. It is reported in current literature that among high-risk patients with mild to moderate COVID-19, casirivimab/imdevimab and bamlanivimab/etesevimab treatment was associated with a significantly lower rate of hospitalization. The aim of this study is to determine the ability of these monoclonal antibodies at preventing disease progression and subsequent hospitalization in patients diagnosed with COVID-19.

**Methods:** A single-center retrospective chart review of adult patients, age 18 years and older, who received monoclonal antibodies for the prevention of disease progression of COVID-19, were evaluated to determine the efficacy of treatment at preventing hospitalization. The primary outcome was the rate of hospital admission after administration of monoclonal antibodies. Patients were not included in the admission rate if they were admitted to the hospital for reasons other than COVID-19 disease progression. A sub-analysis was also completed to assess if there was a statistical difference between admission rates for bamlanivimab/etesevimab versus casirivimab/imdevimab.

**Results:** The number and statistical significance of admissions post administration of monoclonal antibodies will be recorded and the results will be presented.

**Conclusions:** It is anticipated that this study will demonstrate that monoclonal antibodies prevent disease progression to the point of hospitalization of high-risk patients with COVID-19.
Impact of a nurse-pharmacist driven antimicrobial stewardship: redefining the team

Authors: Aislinn Brooks, PharmD, BCPS; Salwa Elarabi, R.Ph. BCPS-AQ ID; Jorge Fleisher, MD

Title: Impact of a nurse-pharmacist driven antimicrobial stewardship: redefining the team

Methods: The aim was ≥20% of ICU Clostridioides difficile (C. difficile), respiratory, and urine culture interventions made by the Nurse-Infectious Diseases (ID) Pharmacist AMS team would be accepted by March 4th, 2022. The ID Pharmacist identified AMS nurse champions and engaged front line nurses in SEMC's AMS program by providing continuing education, attending morning nursing huddles, and creating algorithms to guide nursing to appropriate culturing practices. Nurses utilized the algorithms to assess appropriateness of the cultures ordered. If deemed inappropriate, nurses contacted the ID Pharmacist and/or ordering physician to intervene. The outcome measure assessed was the percentage of interventions accepted for inappropriate C. difficile, respiratory, and/or urine cultures weekly. Process measures included time (in hours) to discontinue inappropriate cultures and the type of culture addressed. The balancing measure was the average time the Nurse/ID Pharmacist spent to assess appropriateness of ordered culture.

Results: From the implementation of the project until March 4, 2022, a total of 69 interventions were made by the Nurse/ID Pharmacist AMS team. Due to a high intervention acceptance rate, the target was changed from 20% to 60% at week eight. Out of the 69 interventions, 91% (n=63) were accepted and resulted in the discontinuation of the culture. The majority of accepted interventions were among urine cultures, with the least being respiratory. The average time to discontinue inappropriate C. difficile, respiratory, and/or urine cultures was 2 hours. The average time the Nurse/ID Pharmacist spent to assess appropriateness of C. difficile, respiratory, and/or urine cultures was 15 minutes.
Conclusions: The implementation of a Nurse/ID Pharmacist AMS collaboration resulted in a high acceptance of culture interventions leading to discontinuation of inappropriate cultures. Integrating front line nurses at the bedside into AMS program initiatives resulted in expanding the team and led to improved microbial culture practices in the ICU. Future expansion of this collaborative effort to other hospital units could further strengthen SEMC’s AMS program.
Risk factors for outpatient parenteral antimicrobial therapy (OPAT)-related adverse drug events: a case-control study

**Objectives:** Outpatient parenteral antimicrobial therapy (OPAT) facilitates shorter hospitalizations, lower nosocomial infection risk, reduced costs, and improved patient quality of life. Despite these benefits, adverse drug events (ADEs) are a common and potentially preventable challenge that may contribute to 30-day readmissions and other negative outcomes. The first study aim is to characterize incidence, type, and timing of significant ADEs within a large OPAT population; the second aim is to identify independent risk factors for the development of a significant OPAT ADE.

**Methods:** This is a retrospective case-control study of adults discharged from a large academic medical center on OPAT from January 2021 â€“ October 2021. The source population will be identified via electronic report of documented pharmacist encounters in the medical record. The case group will consist of patients that experienced a significant ADE during OPAT, whereas the control group will consist of patients that did not. A significant OPAT-related ADE will be defined as any ADE that occurred during OPAT which resulted in an emergency department visit, hospital readmission, antimicrobial dose adjustment, antimicrobial regimen change, or early cessation of OPAT.

**Results:** Descriptive statistics will be used to characterize the study population as well as ADE incidence, distribution of ADE type, and median time-to-ADE. Risk factors for OPAT-related ADEs will be identified in a multivariable logistic regression model, after including exposure variables that were found to be significant on univariate analysis between cases and controls. Independent ADE risk factors will be expressed in the final model using adjusted odds ratios and a significance level of <0.05.

**Conclusions:** It is anticipated that the study results will provide insight on how to best tailor aspects of OPAT care such as frequency and type of monitoring, patient selection, and antimicrobial selection prior to hospital discharge. By incorporating this information into practice, there is the potential to mitigate future risk in this patient population.
**Objectives:** Dalbavancin (DAL) is a long acting injectable antibiotic that is FDA-approved for the treatment of acute bacterial skin and skin structure infections (ABSSSI) caused by susceptible gram-positive organisms. Utilization of DAL therapy may prevent hospitalization for the treatment of ABSSSI in the absence of other acute medical conditions. A guideline for use of DAL in the emergency department (ED) of a single center community hospital was implemented in 2017, however utilization decreased over time. The objectives of this study were to compare rates of hospitalization for ABSSSI and adherence to the DAL guideline between patients before and after guideline revision and education.

**Methods:** The ED DAL guideline was revised and education was presented to providers in December 2021. A retrospective review of patients hospitalized for ABSSSI was conducted to compare outcomes with the previous DAL guideline (December 2020-March 2021) to the revised DAL guideline (December 2021-March 2022). Patients who received DAL therapy during the same time periods were identified using alerts from clinical decision support software.

**Results:** A total of seventy-three patients in the previous guideline group and fifty-seven patients in the revised guideline group were identified as being hospitalized for treatment of ABSSSI with IV antibiotics; after randomization, thirty-seven patients in the previous guideline group and twenty-nine patients in the revised guideline group were included for analysis. DAL was ordered by ED providers five times in the previous guideline group and six times in the revised guideline group; of those orders, DAL was appropriate according to the guideline in three cases (60%) in the previous guideline group and in 6 cases (100%) in the revised guideline group. Fourteen patients in the previous guideline group and thirteen patients in the revised guideline group met criteria for treatment with DAL and possibly could have avoided hospitalization for treatment with IV antibiotics. Of the patients that received DAL, the approved follow-up processes were followed in four patients (80%) in the previous guideline group and five patients (83%) in the revised guideline group.

**Conclusions:** Implementation of an ED guideline for the administration of DAL could help reduce hospitalizations for ABSSSI. Some barriers to DAL use that were identified included lack of provider familiarity and education regarding the DAL protocol and the implementation of other...
higher priority processes during the time of this study. Further research including a broader time range and in-depth provider education could deliver more insight into the true impact of DAL on hospitalization rates for ABSSSI.
Conference Abstracts
May 16-18, 2022

Presenter Name: Cason, Miranda
Organization: Penn State Health St. Joseph Medical Center
Category: Infectious Diseases
Day | Session | Room | Time: Monday | 1 | Magnolia A | 1:15:00 PM

Authors: Miranda Cason, PharmD.

Title: De-escalation of empiric vancomycin therapy after a negative nasal methicillin-resistant staphylococcus aureus (MRSA) polymerase chain reaction (PCR) result in patients with suspected pneumonia

Objectives: Guidelines for the treatment of community acquired pneumonia recommend initiation of antibiotics that cover MRSA in at risk patients. However, due to the lack of guidance on de-escalation, vancomycin gets unnecessarily continued for extended periods of time until respiratory cultures return. The objective of this study is to determine the time to de-escalation/discontinuation of vancomycin after a negative nasal MRSA PCR result in patients empirically treated for pneumonia.

Methods: Adult patients were retrospectively identified through the electronic medical record and included if they were initiated on vancomycin therapy as empiric MRSA coverage for suspected pneumonia at Penn State Health St. Joseph. Exclusion criteria included patients less than 18 years old, history of MRSA, immunocompromised/neutropenic patients (ANC < 1,500 cells/mm3), patients with positive blood cultures, and patients being treated for infection other than pneumonia. Descriptive statistics, chi-square test, or Fisher's Exact test where appropriate, will be performed to examine the association between two categorical variables.

Results: The average time to de-escalation of vancomycin after a negative MRSA PCR will be recorded and results will be presented. Other results will include patient demographics, percentage of patients started on vancomycin that had a MRSA PCR ordered, and percentage of patients that had a pharmacy intervention documented or infectious diseases consult placed.

Conclusions: It is anticipated that this project will reveal an area where antimicrobial stewardship can be improved at Penn State Health St. Joseph and will be used to support the increased utilization of MRSA PCR tests in patients with suspected pneumonia.
Authors: Anna Chen, PharmD, BCPS; Kirsten Vest, PharmD, BCIDP; Nabeela Ahmed, PharmD

Title: Timing of corticosteroid initiation in relation to symptom onset in severe COVID-19

Objectives: Corticosteroids have proved to be a pertinent phase-specific therapy in the proinflammatory phase of SARS-CoV-2 infection. The optimal timing of corticosteroid from onset of symptoms, however, is unknown. A retrospective observational study of an eight-hospital acute care health system found that initiation of corticosteroids at greater than 72 hours duration of hospitalization offered a significant mortality benefit and that treatment prior to this time period did not reduce the likelihood of death. This retrospective project aims to evaluate whether the timing of corticosteroid initiation in relation to symptom onset influences discharge rates as well as time to mechanical ventilation, time to ICU admission, and total length of stay in hospitalized patients with severe COVID-19 infection at the James J. Peters VA Medical Center.

Methods: A retrospective chart review was conducted of the Computerized Patient Record System (CPRS) to assess the clinical outcomes in hospitalized patients with severe COVID-19 treated with systemic corticosteroids from July 1, 2020 to February 28, 2022. Adults hospitalized with severe COVID-19 who received dexamethasone 6 mg for a planned duration of 10 days were included. Patients who left the hospital against medical advice or were transferred to external hospitals were excluded. The primary outcome was the likelihood of being discharged from the hospital for patients who started systemic corticosteroids within 3 days of symptom onset, between 4-7 days of symptom onset, and after 7 days from symptom onset of COVID-19. Secondary outcomes included time to mechanical ventilation from symptom onset and from start of corticosteroids, time to intensive care unit admission from symptom onset and from start of corticosteroids, and total length of hospital stay.

Results: Results are currently pending

Conclusions: Results are currently pending
Conference Abstracts
May 16-18, 2022

Presenter Name: Chen, Ting
Organization: James J. Peters VA Medical Center
Category: Infectious Diseases
Day | Session | Room | Time: Wednesday | 6 | Empire B | 3:15:00 PM

Authors: Ting Chen, PharmD; Kirsten Vest, PharmD, BCIDP
Title: Evaluation of Treatment Outcomes for Hemodialysis Catheter-related Bloodstream Infection with Antibiotic Lock Therapy in a Veteran Population

Objectives: Approximately 20% of hemodialysis patients use a tunneled central venous catheter for vascular access. The majority of bloodstream infections in hemodialysis patients are caused by infected vascular access catheters. It is estimated that the frequency of catheter-related bacteraemia ranges from 2 to 5.5 per 1000 patient-days. In most cases, treatment of catheter-related bloodstream infections (CRBSI) requires a combination of systemic antibiotics and removal of the infected catheter, especially in cases of Staphylococcus aureus and Pseudomonas aeruginosa. Removal of dialysis catheters poses a major challenge in hemodialysis patients who have no alternative site of access. The use of antibiotic lock therapy to salvage the dialysis catheter is considered a viable option in certain cases when it is inadvisable to remove the catheter. The primary objective of this evaluation will be to compare the rate of clinical cure of antibiotic lock therapy versus line removal in patients with a confirmed diagnosis of hemodialysis CRBSI.

Methods: A retrospective chart review will be conducted using the computerized patient record system (CPRS). All patients diagnosed with bacteremia from January 1st 2015 to January 31st 2021 will be screened for inclusion. All episodes of CRBSI with the source being a hemodialysis-related catheter will be included. Patients will be excluded if there was no hemodialysis catheter at the time of bacteremia, documented bloodstream infections from alternative sources, and patients with an unclear date of catheter placement. The primary endpoint will be to compare the rate of clinical cure of antibiotic lock therapy versus line removal in patients with a confirmed diagnosis of hemodialysis CRBSI. Clinical cure will be defined as fever resolution within 72 hours, absence of recurrent bacteremia within 90 days, and absence of mortality while on treatment. The secondary endpoints will be to determine time to next hemodialysis CRBSI after clinical cure, compare the incidence of hemodialysis CRBSI based on catheter site, and assess the relationship between the type of causative organisms and rate of clinical cure.

Results: Data pertaining to primary and secondary endpoints will be collected and results will be presented.
Conclusions: It is hypothesized that the rate of clinical cure using antibiotic lock therapy will be lower than line removal in patients with a confirmed diagnosis of hemodialysis CRBSI. The final analyzed results will be presented.
Prospective analysis of a pharmacist-driven drug monitoring program to optimize vancomycin use in patients with methicillin-resistant staphylococcus aureus invasive infections

**Authors:** D. Chowdhury, G. Fahim, M. Shah, AS Mathis, H Lee Ghin; RWJBarnabas Health Monmouth Medical Center, Long Branch, New Jersey

**Title:** Prospective analysis of a pharmacist-driven drug monitoring program to optimize vancomycin use in patients with methicillin-resistant staphylococcus aureus invasive infections

**Objectives:** Recent clinical data on vancomycin pharmacokinetics and pharmacodynamics suggested a reevaluation of the dosing and monitoring recommendations by emphasizing a ratio of the area under the curve over 24 hours/minimum inhibitory concentration (AUC/MIC). The aim of this study is to evaluate the impact and utilization of a vancomycin dosing software by pharmacists at our institution. By having a pharmacist-driven drug dosing and monitoring program in place, vancomycin drug utilization in patients with methicillin-resistant Staphylococcus aureus (MRSA) bacteremia can be optimized to provide better efficacy and improve patient safety through more precise dosing and decreases incidence of adverse events.

**Methods:** Electronic medical records of patients who were admitted to a single hospital over the course of two years being treated with vancomycin for a MRSA bacteremia infection were reviewed. Pharmacists were educated in various ways on this new initiative and the utilization of the pharmacist-driven drug software program. When assessing a patient, the pharmacist conducted a thorough chart review to evaluate if the patient fit the criteria to be a candidate based on the updated vancomycin dosing guidelines.

**Results:** The number and percentage of treatments associated with interventions from a pharmacist, as well as the results from staff education will be presented.

**Conclusions:** It is anticipated that this study will demonstrate a role for pharmacist-driven drug monitoring and intervention resulting in optimized utilization of vancomycin in patients with MRSA bacteremia and a decreased incidence of adverse events.
**Presentation Title:** Clinical impact of fluoroquinolone breakpoint changes on treatment outcomes in patients with Enterobacterales bacteremia

**Authors:** Amanda Chron, PharmD, MS; Jeffrey Pearson, PharmD, BCIDP; David Kubiak, PharmD, BCPS, BCIDP; Sanjat Kanjilal, MD, MPH; Brandon Dionne, PharmD, BCPS-AQ ID, BCIDP, AAHIVP

**Objectives:**
- In 2019, the Clinical Laboratory Standards Institute (CLSI) lowered the Enterobacterales breakpoints for fluoroquinolones based on pharmacokinetic and pharmacodynamic target attainment data as well as concern for low-level resistance mutations. In this study, we aimed to evaluate outcomes in patients who received ciprofloxacin or levofloxacin for an Enterobacterales bloodstream infection with a minimum inhibitory concentration (MIC) considered susceptible by pre-2019 CLSI breakpoints, but now considered intermediate or resistant after the 2019 CLSI updates.

**Methods:**
- This single-center, retrospective, observational analysis included patients from January 1, 2010 through December 31, 2020 with blood cultures positive for Enterobacterales with a fluoroquinolone MIC considered susceptible by pre-2019 CLSI breakpoints who received fluoroquinolone therapy. Patients were excluded if they received a fluoroquinolone for 72 hours or less, had fluoroquinolone therapy initiated more than 4 days from index blood culture, polymicrobial bacteremia, or concomitant infection with an organism other than the one present in the blood. The major outcome was 30-day clinical failure, defined as recurrence of bacteremia, infection-related readmission, or death due to any cause.

**Results:**
- A total of 42 patients were included in the pre-CLSI breakpoint cohort. The source of bacteremia was most commonly urinary tract infection (66.6%; n=28) and the organism most isolated was Escherichia coli (71.4%; n=30). Overall 30-day clinical failure occurred in 11.9% of patients (n=5), where 2.4% (n=1) had recurrence of bacteremia, 4.8% (n=2) had infection-related readmission, and 7.1% (n=3) died. Based on current CLSI breakpoints, the failure rate for patients treated with ciprofloxacin with a non-susceptible MIC was 12.5% (n=1), levofloxacin with a non-susceptible MIC was 10% (n=2), and ciprofloxacin with an isolate susceptible to ciprofloxacin but non-susceptible to levofloxacin was 14.3% (n=2). The median hospital length of stay was 4.4 days (IQR 3.1-6.1) and the median total duration of fluoroquinolone therapy was 13 days (IQR 11-15).
**Conclusions:** The results of this study will help us better understand the clinical outcomes of fluoroquinolone treatment for patients with Enterobacterales bacteremia based on prior CLSI breakpoints compared to updated breakpoints.
Presenter Name: Clevenstine, Samantha  
Organization: Cape Regional Medical Center  
Category: Infectious Diseases  
Day | Session | Room | Time: Tuesday | 3 | Magnolia C | 1:30:00 PM

Authors: Samantha A. Clevenstine, PharmD; Michael L. Brocco, PharmD, BCPS; Richard J. Artyomowicz, PharmD, MBA, FCCP, BCPS

Title: Documenting penicillin allergies: The impact on a small community hospital

Objectives: Penicillin allergies are reported in 10% of the population, but less than 1% of the population is truly allergic to penicillin. It is estimated that approximately 80% of true penicillin allergies lose their sensitivity after 10 years. However, providers are still wary of prescribing a beta-lactam with a documented allergy. Assessment tools, such as PEN-FAST, have been created to risk stratify penicillin allergies. Despite education on cross-reactivity in 2019, our institution saw a rise in aztreonam use.

Methods: A prospective chart review was conducted from February 1st, 2022 to March 25th, 2022 of patients who were admitted with a listed penicillin allergy and had at least one antibiotic ordered. Patients were interviewed and scored accordingly using PEN-FAST to quantify the risk for an allergic reaction. Important allergy information was documented in the patient's electronic health record, and interventions were made as needed. A retrospective chart review was conducted of patients with a listed penicillin allergy from February 1st, 2021 to March 25th, 2021 for comparison of our interventions. Patients with more than one hospital admission during the study period, patients who were less than 18 years old, or patients who were unable to provide an allergy history due to mental status were excluded from this study. The primary objective is the percentage of beta-lactam antibiotics used. The secondary objectives are the number of documented allergic reactions; the percentage of reactions that occurred after beta-lactam administration; the number of patients who received aztreonam, fluoroquinolones and vancomycin; and the rate of hospital-acquired Clostridioides difficile (C. Diff).

Results: The usage of beta-lactams and broad-spectrum antibiotics, the number of documented allergic reactions, and the rate of hospital-acquired C. diff will be presented.

Conclusions: The usage of beta-lactams and broad-spectrum antibiotics, the number of documented allergic reactions, and the rate of hospital-acquired C. diff will be presented.
**Authors:** Daniel Cox, PharmD, MBA; Danielle Hoff, PharmD; Kelci Hall, PharmD; Mathew Johnson, PharmD, BCCCP

**Title:** Comparison of Dexamethasone Dosing Strategies in COVID-19 ARDS

**Objectives:** Comparison of dexamethasone 6 mg for 10 days versus dexamethasone 20 mg for 5 days followed by dexamethasone 10 mg for 5 days for patients admitted to ICU. Primary outcome assessed was in-hospital mortality. Secondary outcomes included ICU length of stay, hospital length of stay, duration of mechanical ventilation, and adverse events.

**Methods:** Retrospective cohort study conducted at an academic medical center. Data collected utilizing internal COVID-19 registry. Patients were included in the study if they were greater than or equal to 18 years of age, received one of the two aforementioned steroid regimens, had a confirmed diagnosis of COVID-19, met ARDS criteria within 24 hours of hospital admission, and received mechanical ventilation within 48 hours of hospital admission. Patients were excluded from the study if there was use of immunosuppressive agents for autoimmune conditions or transplants, use of steroids prior to one of the study regimens, patients who crossed into other treatment group after receiving greater than 48 hours of therapy, patients receiving steroids greater than 10 days, or those who arrived from an outlying facility.

**Results:** The primary outcome of in-hospital mortality occurred in 9/11 patients (81.8%) within the high dose dexamethasone arm and in 3/6 patients (50%) in the low dose dexamethasone treatment arm. The difference between the two groups was not found to be statistically significant. No statistically significant differences were found for any of the secondary outcomes.

**Conclusions:** Patients with acute respiratory distress syndrome secondary to COVID-19 were not found to have a statistically significant difference in in-hospital mortality when given dexamethasone 6 mg for 10 days versus dexamethasone 20 mg for 5 days followed by 10 mg for 5 days. Due to the limited patients population and retrospective nature of this study, more study are needed to evaluate the safety and efficacy for patients receiving dexamethasone therapy for COVID-19 ARDS.
Comparison of Dexamethasone Dosing Strategies in COVID-19 ARDS

Authors: Daniel Cox, PharmD, MBA; Danielle Hoff, PharmD; Kelci Hall, PharmD; Mathew Johnson, PharmD, BCCCP

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Conclusions: Patients with acute respiratory distress syndrome secondary to COVID-19 were not found to have a statistically significant difference in in-hospital mortality when given dexamethasone 6 mg for 10 days versus dexamethasone 20 mg for 5 days followed by 10 mg for 5 days. Due to the limited patients population and retrospective nature of this study, more study are needed to evaluate the safety and efficacy for patients receiving dexamethasone therapy for COVID-19 ARDS.
**Presenter Name:** Cruickshank, Rachel  
**Organization:** Charleston Area Medical Center  
**Category:** Infectious Diseases  
**Day | Session | Room | Time:** Monday | 2 | Magnolia C | 3:45:00 PM

**Authors:** Rachel Cruickshank, PharmD, Jessica Robinson, PharmD, BCPS, BCIDP, Brian Keen, PharmD, Stacie Deslich, Apexa Patel

**Title:** Evaluation of antimicrobial stewardship when using BioFire FilmArray Pneumonia Panel

**Objectives:** The goal of this study is to determine if the use of the BioFire Pneumonia Panel has led to positive impacts on antimicrobial stewardship in the intensive care units at Charleston Area Medical Center (CAMC).

**Methods:** A total of 111 adult patients who were diagnosed with pneumonia in the intensive care unit (ICU), 59 patients diagnosed with standard of care and 52 patients diagnosed with the BioFire Pneumonia Panel, between September 1, 2018 – February 28, 2019 and September 1, 2019 – February 28, 2020, were included. For data collection, the following information was documented: length of stay, ICU length of stay, antibiotic indication, urine antigen collection and results, sputum culture collection and result, PCR collection and result, antibiotics, days of therapy, infectious disease consult, and if there was a C. diff diagnosis during admission. For each patient, their antimicrobial therapies were placed into one of eight categories regarding appropriate/inappropriateness of the therapy after a specific pathogen was identified.

**Results:** Standard of care showed more appropriate continuations in therapy with no change compared to BioFire PCR (30% vs 11%, p=0.015). Standard of care was less likely to have an appropriate escalation of therapy compared to BioFire PCR (0% vs 7.7%, p=0.03). There was no statistical difference between the two groups in appropriate discontinuation (1.7% vs 3.8%, p=0.48), appropriate de-escalation (27.1% vs 42.3%, p=0.09), inappropriate continuation (13.6% vs 13.5%, p=0.99), inappropriate escalation (8.5% vs 7.7%, p=0.88), or inappropriate de-escalation (13.6% vs 13.5%, p=0.99). The most common antibiotics used in each group were vancomycin and piperacillin/tazobactam.

**Conclusions:** Based on these results, the BioFire FilmArray Pneumonia Panel is a great tool that can help guide therapy, but the panel alone does not make an impact without the help of an antimicrobial stewardship pharmacist to guide therapy. The use of the PCR did not show a significant positive impact on antimicrobial stewardship other than escalating therapy guided toward a specific pathogen.
Conference Abstracts  
May 16-18, 2022

Presenter Name: Cruz, Sarah  
Organization: VA Connecticut Healthcare System  
Category: Infectious Diseases  
Day | Session | Room | Time: Monday | 1 | Magnolia B | 1:30:00 PM

Authors: S. Cruz, R. Curtin, B. Kotansky; Veterans Affairs Healthcare System, West Haven, Connecticut

Title: Implementation of a standardized process for outpatient COVID-19 treatments at a Veterans Affairs (VA) hospital

Objectives: Multiple pharmacologic agents have recently been introduced into healthcare systems for the treatment of mild-to-moderate symptomatic COVID-19 infection in patients at high risk for severe disease in the ambulatory setting. With challenges such as product availability, coordination of timely dispensing and administration, and many patient-specific factors to consider prior to selecting the most appropriate therapy, it is imperative that healthcare professionals collaborate to provide high quality care to patients in an efficient way. At the VA Connecticut Healthcare System, patient eligibility requests for COVID-19 outpatient therapy are reviewed by clinical pharmacists to determine which treatment options are available and most appropriate for each patient based upon a comprehensive review of patient factors including vaccination status, risk for disease progression, and presence of potential drug interactions with concomitant medications. This project aims to analyze the newly-implemented treatment process utilized at VA Connecticut (VACT) to effectively allocate the available supplies of molnupiravir, nirmatrelvir/ritonavir, remdesivir, and sotrovimab.

Methods: This evaluation was approved by the VACT Institutional Review Board as a quality improvement project. Veterans considered for outpatient treatments for mild-to-moderate symptomatic COVID-19 infection at VACT between January 11, 2022 and March 11, 2022 will be included in this retrospective chart review. Patient demographics and treatment-related information will be collected from the electronic health record. Outcome measurements collected will include adverse drug reactions (ADRs) within 7 days of initiation of COVID-19 treatment, hospitalization for COVID-19 within 30 days of treatment initiation, and death within 30 days of treatment initiation.

Results: Data will be analyzed to assess for trends in patient characteristics and utilization of the available therapies. Of those who did not receive treatment, the reasoning will be evaluated. The ADR, hospitalization, and death outcomes following treatment initiation will also be presented. Potential opportunities to identify areas for improvement with the process will also be considered.
Conclusions: It is anticipated that this project will demonstrate the role for pharmacist-based patient assessment in the selection and allocation of appropriate outpatient treatments for COVID-19 infection based upon the most updated evidence-based recommendations and site-specific product availability.
Penicillin allergy assessments and interventions

Approximately 90% of patients with a listed penicillin (PCN) allergy could safely receive beta-lactam antibiotics, but the presence of unnecessary PCN allergies in patient charts leads to overuse of broad spectrum antibiotics with more toxic effects, poorer outcomes for patients, and increased costs to health systems. The objective was to review patients with a PCN allergy and determine the proportion appropriate to undergo an intervention of delabeling or consideration for a formal allergy assessment. The results of this study could provide evidence as to which patients could benefit from PCN allergy delabeling/formal allergy assessment, as well as provide a templated tool for providers to collect information for patient evaluation.

Methods: This project was a cross-sectional survey in which patients were identified with an active PCN allergy in the chart who could benefit from PCN allergy delabeling. Once patients were identified, they were contacted via phone and asked a series of screening questions to determine whether or not they were a candidate for PCN allergy delabeling or a formal allergy assessment. The primary outcome of this study was the percentage of patients determined to be appropriate candidates for allergy delabeling/formal allergy assessment, while secondary outcomes were percentage of patients determined to be candidates who had a PCN allergy removed, or a formal allergy assessment consult placed.

Results: A total of 40 patients who met criteria were contacted. For the primary outcome, 82.5% (n=33) of patients were determined to be candidates for allergy delabeling/formal allergy assessment. For secondary outcomes, among patients appropriate for allergy delabeling/formal allergy assessment, 12.1% (n=4) were able to be delabeled immediately through screening question responses, and 39.4% (n=13) were interested in placing a consult with a community allergy clinic for further evaluation.

Conclusions: This study shows that over 80% of patients at the Lebanon VA who were identified with a PCN allergy and included in this study were appropriate candidates for allergy delabeling or a formal allergy assessment. This study also shows that use of an effective screening tool can help immediately remove a PCN allergy from a patient chart without a formal allergy assessment.
Objective: Beta lactams are the most prescribed class of antibiotics and are recommended as a first line treatment for various infections. Studies have suggested that the best predictor of beta lactam response is the amount of time the concentration of the antibiotic is maintained over the minimum inhibitory concentration. While the pharmacodynamic exposure of beta lactams has been adequately characterized in the general population, there is limited data in patients with obesity and augmented renal clearance who have altered pharmacokinetic profiles. The purpose of this research is to answer the question: is high dose extended infusion beta lactam therapy more efficacious than standard infusion therapy in critically ill patients who are obese or have augmented renal clearance?

Methods: This research included both a retrospective and prospective cohort from a single community hospital. Patients who received piperacillin/tazobactam, cefepime, or meropenem were screened for both obesity and augmented renal clearance. The primary outcome was therapeutic failure, defined as persistent or recurrent fever, organ dysfunction, clinical and biological symptoms of infection at the end of treatment with study drug, and the need for escalating empiric antibiotic therapy. Secondary outcomes include intensive care unit length of stay, 14-day and 30-day survival, antibiotic re-initiation greater than or equal to 48 hours after completion of study drug, and adverse drug events. Unpaired t-test was used to analyze continuous data. Chi squared test was used to analyze categorical data. Descriptive statistics was used to analyze the adverse events.

Results: The number and percentage of therapeutic failure, along with the secondary endpoints will be recorded and results will be presented.

Conclusions: It is anticipated that high dose extended infusion beta lactam therapy in obese and augmented renal clearance patients will show a decrease in therapeutic failure and length of stay in the ICU.
**Conference Abstracts**  
May 16-18, 2022

**Presenter Name:** Doan, Kevin  
**Organization:** Cooperman Barnabas Medical Center  
**Category:** Infectious Diseases  
**Day | Session | Room | Time:** Tuesday | 4 | Magnolia A | 4:15:00 PM

**Authors:** Kevin Doan, PharmD; Steven Smoke, PharmD, BCPS, BCIDP; Alison Brophy, PharmD, BCPS, BCCCP

**Title:** Antibiotic de-escalation in pneumonia with pharmacist ordering of methicillin-resistant staphylococcus aureus nasal swabs

**Objectives:** When Methicillin-resistant Staphylococcus aureus (MRSA) is the causative pathogen in pneumonia, mortality rate is approximately 80%. However, the occurrence of MRSA pneumonia is uncommon, with a reported incidence of approximately 4.2%. Vancomycin is often empirically utilized for MRSA pneumonia coverage, but can lead to serious harm such as acute kidney injury and antibiotic resistance. The purpose of this study was measure the impact of a pharmacy-driven MRSA nares testing protocol on vancomycin prescribing patterns and clinical outcomes in patients diagnosed with pneumonia.

**Methods:** In this single-center, quasi-experimental study, we evaluated the use of a MRSA nasal swab on patients diagnosed with community-acquired pneumonia, hospital-acquired pneumonia, and ventilator-associated pneumonia. This study consisted of three phases, the pre-implementation phase, the active/educational phase, and the post-implementation phase that occurred from August 15, 2021 – November 15, 2021, November 16, 2021 – February 15, 2022, and February 16, 2022 – May 15, 2022, respectively. The primary outcome was vancomycin duration of therapy. Secondary outcomes included the occurrence of acute kidney injury, duration of hospital stay, number of vancomycin levels obtained, and number of MRSA nares swabs ordered.

**Results:** The pre-implementation phase (n=39) and the active phase (n=45) demonstrated similar baseline characteristics with the exception of procalcitonin (median 0.18ng/mL vs. 0.35ng/mL) and positive patients with Coronavirus Disease 2019 (n=1 vs. n=8), respectively. The number of MRSA nares swabs ordered were 10 (25.6%) in the pre-implementation phase and 27 (60%) in the active phase. The primary outcome for duration of therapy 0-72 hours demonstrated 61.5% vs 77.8% between the pre-implementation and active phase groups. There was no significant differences in secondary outcomes between the pre-implementation and active phase, besides for the increased number of MRSA nares swabs ordered. Preliminary findings for the post-implementation phase will be presented.

**Conclusions:** To be presented at the conference
Conference Abstracts
May 16-18, 2022

Presenter Name: Donnelly, Devin
Organization: Rochester General Hospital
Category: Infectious Diseases
Day | Session | Room | Time: Wednesday | 5 | Magnolia B | 12:45:00 PM

Authors: D. Donnelly, J. Palumbo, M. Hite, N. Castor, M. Laguio-Vila, M. Staicu; Rochester General Hospital, Rochester, New York

Title: Impact of Accelerate Phenotest BC kit on time to optimal antimicrobial therapy among inpatients with extended-spectrum beta-lactamase producing E. coli and Klebsiella species bloodstream infection: a retrospective cohort study

Objectives: Accelerate Phenotest BC (Blood Culture) kit is a rapid diagnostic instrument for blood cultures that can identify organisms and their susceptibilities in about seven hours after a positive result. The purpose of this study was to determine if the use of Accelerate Phenotest BC kit in patients with extended-spectrum beta-lactamase (ESBL) producing E. coli and Klebsiella species bloodstream infections minimizes the time to optimal antibiotics and reduces adverse events compared to traditional microbiology methods. It was hypothesized that utilization of this technology would be associated with a faster time to optimal antibiotics, and subsequently, less adverse events.

Methods: Medical records of patients with documented evidence of an ESBL bloodstream infection at a 528-bed teaching hospital were retrospectively reviewed. Cases were identified throughout the period of Accelerate Phenotest BC kit's implementation (August 2020 - March 2022) and matched with historical controls (January 2013 - June 2020) based on gender, age (± four years), ESBL organism, and source of infection. Data assessed included: hospital length of stay, blood culture collection and result time, and antibiotic administration data. The primary outcome was the time to optimal antibiotic therapy, as defined by national and institutional guidelines.

Results: The time from initial antibiotic to optimal antibiotic will be recorded and results will be presented.

Conclusions: It is anticipated that this project will highlight Accelerate Phenotest BC kit's ability to help get hospitalized patients with ESBL bacteremia on optimal antibiotics faster than conventional blood culture methods.
Authors: Skyee Edwards, PharmD; Eric Likar, PharmD; Jeff Quedado, PharmD

Title: Evaluation of surgical site infections in postoperative patients with a documented beta lactam allergy

Objectives: To determine the incidence of surgical site infections (SSI's) in patients with a documented beta lactam allergy that received primary versus secondary antimicrobial surgical prophylaxis regimens.

Methods: This is an institutional review board (IRB) approved, retrospective analysis of patients greater than or equal to 18 years of age with a documented beta lactam allergy that received periprocedural surgical prophylaxis. The objectives were to determine rates of surgical site infections based on antimicrobial regimen utilized and stratify results to pertinent variables which include antibiotic selection, surgical service, adverse events, post operative duration and rates of adherence to primary regimens. Surgical patients were identified during a prespecified time frame, data variables were collected, and statistical analyses performed to demonstrate power.

Results: Results are in progress and will be finalized and reported out at the meeting.

Conclusions: Surgical site infections (SSI) can lead to increased morbidity and mortality for patients and financial costs for the institution. Beta lactam antibiotics are recommended as first line agents for surgical prophylaxis by the American Society of Health-System Pharmacy (ASHP) Clinical Practice Guidelines for Antimicrobial Prophylaxis in Surgery. Patients with documented beta lactam allergies often receive second line therapy options. These second line agents are associated with adverse events, such as Clostridioides difficile, and potentially decreased efficacy.
Prevalence of vancomycin-induced acute kidney injury in traditional dosing versus area under the curve dosing at a community hospital

**Objectives:**
The 2020 Infectious Disease Society of America (IDSA) Clinical Practice Guidelines recommend dosing vancomycin based on Area Under the Curve (AUC) and have established the relationship between vancomycin dosing to AUC and the minimum inhibitory concentration (MIC) or AUC:MIC as a useful pharmacodynamic parameter to predict effectiveness compared to trough dosing for methicillin resistant staphylococcus aureus (MRSA) infections. Patients dosed via a targeted AUC have shown to be associated with a lower incidence of nephrotoxicity relative to trough-based dosing. The aim of this study is to compare if rates of acute kidney injury (AKI) have changed from assessing vancomycin patients’ pre and post implementation of AUC dosing.

**Methods:**
A single-center retrospective chart review of adult patients, age 18 years and older, receiving vancomycin dosed as either trough-based or AUC-based were assessed for an AKI. Patients included were receiving vancomycin for a minimum of 72 hours irrespective of indication and culture growth. The primary outcomes included vancomycin dosing with the highest incidence of AKI. A sub analyses was also completed of the patient population assessing other nephrotoxic medication that was received, relative comorbidities, duration of vancomycin, patient's body mass index (BMI), and worsening of kidney function in patients who had an AKI before vancomycin was initiated.

**Results:**
The number and statistical significance of AKI occurrences for AUC dosing versus trough based dosing will be recorded and results will be presented.

**Conclusions:**
It is anticipated that this project will demonstrate a lower incidence of AKI occurrences with AUC dosing in comparison to trough based dosing.
Evaluating the clinical utility of prophylactic antibiotics in the management of traumatic facial fractures

**Authors:** Madiha Faruqi, PharmD., Deena Rojek, PharmD., Sean Young, PharmD.

**Title:** Evaluating the clinical utility of prophylactic antibiotics in the management of traumatic facial fractures

**Objectives:** Data regarding the role of prophylactic antimicrobial use in patients with traumatic facial fractures remains limited and controversial, leading to a lack of standardization in prescribing patterns across healthcare systems. The aim of this study is to evaluate the appropriateness of current prescribing patterns surrounding prophylactic antibiotics in traumatic facial fracture patients at Paoli Hospital in order to further develop robust recommendations and implement a standardized protocol for the optimal management of these patients.

**Methods:** A retrospective analysis of medical records was conducted to evaluate antimicrobial usage patterns in adult patients presenting with at least one identified traumatic facial fracture to Paoli Hospital between January 1st, 2021 and June 31st, 2021. Patients were excluded if they were less than 18 years of age, received antibiotics for indications other than facial fractures, or were transferred to alternate facilities during their hospital admission. Through a systematic review of patient charts, baseline demographics were collected including age, gender, creatinine clearance, comorbid conditions, medication allergies, fracture type, number of fractures, and management of fracture repair indicated (i.e. operative vs. nonoperative). Data collected regarding antimicrobial therapy included agent administered, dose, time from presentation to initiation of first dose, duration, and cost of therapy. Data collected regarding patient outcomes included incidence of infection at fracture site, incidence of secondary infections attributed to antimicrobial exposure (i.e. Clostridium difficile), 30-day all-cause mortality, 30- and 90-day readmission rates, and hospital length of stay.

**Results:** A total of 63 patient charts were reviewed and 47 patients were ultimately included in the retrospective data analysis. 21 (44.7%) patients received antimicrobial prophylaxis with the most commonly selected antimicrobial agents in the inpatient setting being Cefazolin (37.5%) and Ampicillin-Sulbactam (37.5%). 10 patients were prescribed antimicrobial therapy at discharge with the most commonly prescribed agent being Amoxicillin-Clavulanate. The average duration of therapy was 4.9 days. There were no differences in incidence of infection at fracture site, Clostridium difficile infections, or readmission rates between patients who received prophylactic antibiotics and those who did not, however an increased trend was noted in hospital length of stay for patients who did not receive prophylactic treatment. The use of
extended durations of prophylactic antimicrobial therapies was associated with increased hospital costs.

**Conclusions:** This study illustrated the inconsistent prescribing patterns surrounding the use of prophylactic antibiotics in the management of traumatic facial fractures. The results of this study warranted the need to implement an institution-specific protocol that would guide antimicrobial stewardship and optimize clinical outcomes for patients; the implementation of such a protocol at Paoli Hospital is currently in process.
**Evaluating weight gain in dolutegravir-based antiretroviral therapy without concomitant tenofovir alafenamide**

**Objective:** The Department of Veteran Affairs is the largest provider of HIV care in the US, serving 30,000 veterans, where the prevalence of HIV infection among veterans was found to be disproportionately higher at 1.42% as opposed to 0.39% in the general population. Recommended first-line treatment as per the Department of Health and Human Services (DHHS) consists of integrase inhibitor based regimens. The ADVANCE trial previously found patients taking dolutegravir (DTG) with tenofovir alafenamide (TAF) were at higher risk for treatment-emergent obesity. This quality improvement project is designed to evaluate weight gain in patients taking DTG, without TAF in order to assess its effect on weight gain alone.

**Methods:** A retrospective chart review will be performed on patients taking dolutegravir-based antiretroviral therapy in the VA New Jersey Healthcare System with inclusion criteria of HIV positive patients treated with an active prescription for DTG from a VA provider for 96 consecutive weeks. Exclusion criteria includes any patient with an active prescription for TAF, without a weight within 96 weeks, and non-adherence indicated with a medication possession ratio <80% and/or HIV-RNA greater than 200 copies/mL consecutively. The primary outcome of this project will be assessing any degree of weight gain at follow-up within 96 weeks of DTG initiation, and the secondary outcomes will evaluate metabolic syndrome, specifically a new diagnosis of diabetes or dyslipidemia or exacerbations defined as HbA1c ≥9% or intensification of medication therapy. These will be evaluated using descriptive statistics, measuring severe weight gain as ≥10% from baseline or treatment-emergent obesity.

**Results:** Of 107 patients pooled with an active prescription for a DTG-based antiretroviral therapy, 49 met inclusion criteria. All participants included in this qualitative assessment were male with 90% being treatment-experienced. The primary outcome of any degree of weight gain from baseline was observed in 91% of participants. Severe weight gain was observed in 24% of participants and 8.9% developed treatment-emergent obesity. The secondary outcome of diabetes exacerbation was observed in 2% of participants. The primary and secondary outcomes will be presented in further detail with descriptive statistics.

**Conclusions:** It is anticipated that participants will experience weight gain with DTG, which will have a concomitant effect on associated disorders of dyslipidemia and diabetes.
Impact of an updated vancomycin dosing protocol on nephrotoxicity

Conference Abstracts
May 16-18, 2022

Presenter Name: freij, samer
Organization: Moses Taylor Hospital
Category: Infectious Diseases
Day | Session | Room | Time: Tuesday | 3 | Magnolia B | 1:45:00 PM

Authors: S. Freij, J. Shayka, F. Wellings, N. Folger, M. Musheno, M. Roke-Thomas

Title: Impact of an updated vancomycin dosing protocol on nephrotoxicity

Objectives: At Moses Taylor Hospital, vancomycin dosing and monitoring are guided by a pharmacy-driven protocol that was revised to ensure that doses produce a therapeutic range while minimizing nephrotoxicity. The objective of this research is to evaluate the impact of an updated vancomycin dosing protocol on the incidence of nephrotoxicity in patients treated in a hospital setting.

Methods: This research was performed in two phases, a retrospective phase which included patients treated with vancomycin prior to the protocol update and a prospective phase that included patients treated after. Pertinent data such as serum creatinine values, vancomycin dose, and vancomycin levels, were collected. Using the Acute Kidney Injury Network criteria (increase in absolute serum creatinine of at least 0.3 mg/dL or an increase of greater than or equal to 50 percent of baseline value), a review of the serum creatinine trends was conducted to determine if an acute kidney injury had occurred in the patients treated with vancomycin. Resulting data will be analyzed using the standard Chi Square test to allow for an outcome comparison for the rate of nephrotoxicity between phases.

Results: Final results will be presented.

Conclusions: We hope that the results from the study will reveal the positive impact of the new dosing protocol on patients’ outcomes and guide future treatment approaches to ensure that patients are being treated safely and effectively.
Characteristics of Bloodstream Infections in Cardiothoracic Surgery Patients at High Risk for Infection

Objectives: The reported incidence of bloodstream infections (BSI) in cardiac surgery patients overall ranges from 5% to 21%; however, the incidence of BSI in those requiring mechanical circulatory support, with delayed sternal closure, or receiving thoracic organ transplants is not well defined. Furthermore, there is limited data on BSI treatment outcomes with recommended antimicrobial regimens. We aim to describe the incidence, recurrence, and persistence rate of BSI, describe common pathogens and resistance patterns associated with BSI, determine if empiric therapy adequately covered isolated organisms, and if therapy was de-escalated to an institutional guideline-recommended susceptible agent within 72 hours of final culture result. These outcomes will be compared among patients who are at high risk of infection (defined as patients that required mechanical circulatory support, delayed sternal closure, or thoracic transplant) and those who are not at high risk of infection.

Methods: This is a retrospective, single center, cohort study of adults with positive blood cultures between July 1st, 2016 and June 30th, 2021. Patients were identified using the Society of Thoracic Surgeons database and the electronic medical record. Patients were included if they underwent cardiothoracic surgery, had a positive blood culture within 90 days of surgery, and received antimicrobial therapy other than surgical prophylaxis. Patients with positive blood cultures within seven days prior to index surgery or cultures deemed to be contaminants by the primary team were excluded. Data collected included patient characteristics, type of surgery, empiric antimicrobial regimen, and culture and susceptibility data. Data were analyzed using descriptive statistics. Statistical analyses included chi-squared test for categorical variables, student t-test for parametric continuous variables, and Wilcoxon Rank Sum for nonparametric continuous variables.

Results: Full results to follow. We anticipate to report the percent of patients with positive blood cultures within 90 days of cardiothoracic surgery. We will report the incidence, recurrence, and persistence rate of BSI and will describe common pathogens and resistance patterns associated with the BSI. We will report percent of patients with appropriate empiric treatment and de-escalation of therapy per the JHH antimicrobial use guideline.
**Conclusions:** Conclusion and recommendations will be made once data analysis is completed.
Utility of methicillin-resistant S. aureus nares screening in patients with febrile neutropenia and implications for antimicrobial stewardship

**Objectives:**
Febrile neutropenia is a well-recognized complication of hematologic malignancies and with the use of myelosuppressive chemotherapy in various types of cancer. Methicillin-resistant S. aureus (MRSA) nares screening has a high negative predictive value for MRSA infection, and it has become a popular tool for antimicrobial de-escalation. At this time, the study of MRSA nares screening in febrile neutropenic patients has been limited and further investigation is needed to support its use in this unique patient population.

**Methods:**
Electronic medical records of patients who presented to Anne Arundel Medical Center who were diagnosed with febrile neutropenia and had a MRSA PCR nasal swab collected as part of their infection treatment plan were included. Patient demographics including etiologies of neutropenia were collected in addition to culture data to assess predictive values of MRSA nares in this patient population. Anti-MRSA antimicrobial use data was also collected to assess how the use of this screening tool could impact antimicrobial stewardship and patient care.

**Results:**
The sensitivity, specificity, and positive and negative predictive values of MRSA nares PCR screening will be calculated, and the results will be presented.

**Conclusions:**
It is anticipated that this project will demonstrate both the utility and limitations of MRSA nares screening as an antimicrobial stewardship tool in febrile neutropenic patients.
Prevalence of Treating Asymptomatic Bacteriuria in Adults

Abstract:

Asymptomatic bacteriuria (ASB) is a common problem in hospitalized adults, but most patients derive no benefit from antibiotic therapy and have adverse consequences. Therefore, nonpregnant patients should not be screened or treated for asymptomatic bacteriuria. Per Infectious Disease Society of America (IDSA) guidelines for the treatment of ASB, only patients with asymptomatic bacteriuria that will benefit from treatment such as pregnant women, should be treated. This study assesses the prevalence of treating asymptomatic bacteriuria in adults, antibiotic type, duration of antibiotic use and antibiotic-related side effects including Clostridium difficile infection.

Methods: This study is a retrospective observation of asymptomatic adult patients with confirmed bacteriuria who received antibiotics for ASB. This study will be conducted from January 2022 until May 2022 at Holy Cross Silver Spring Hospital in Maryland. An electronic report will be generated using electronic medical record (EMR) for patients ≥18 years and confirmed bacteriuria. Manual chart review using the electronic medical record (Epic) will be used to assess the antibiotic-related side effects including Clostridium difficile infection, antibiotic selection, wide or narrow spectrum, and antibiotic duration.

Results: The preliminary results shows that 5 out of 50 patients received unnecessary treatment for ASB in hospitalized adults. The complete results will be analyzed and presented.

Conclusions: This research is anticipated to demonstrate a modest prevalence of treating asymptomatic bacteriuria in hospitalized adults. The finalized results will provide more insight and might guide developing strategies to mitigate this practice.
Comparison of acute kidney injury rates with either piperacillin/tazobactam or cefepime in combination with vancomycin

Objectives: Vancomycin, piperacillin/tazobactam, and cefepime continue to be the first choice antibiotics for empiric therapy in hospitalized patients. While studies have shown an increased incidence of nephrotoxicity with vancomycin and piperacillin/tazobactam treatment, there are few comparing the rates to other anti-pseudomonal beta-lactams. The purpose of this analysis is to compare the risk of acute kidney injury (AKI) with vancomycin and piperacillin/tazobactam or cefepime.

Methods: This was a multi-center, retrospective analysis of patients who were initiated on vancomycin with piperacillin/tazobactam (V/PT) or vancomycin with cefepime (V/C) across a community health system between November 1st, 2020 and October 1st, 2021. Patients were identified using the electronic medical record and included if on therapy for >48 hours. Patients were excluded if age <18 years, on renal replacement therapy, admitted from an outside hospital, or pregnant. The primary endpoint was incidence of AKI. Secondary endpoints included mortality rate, length of hospital stay, time to AKI, and severity of AKI. AKI was defined by the Kidney Disease Improving Global Outcomes (KDIGO) 2012 guideline criteria. Other data collected included patient demographics, comorbidities, concomitant nephrotoxic medications, antibiotic indications, patient location, and vancomycin levels at AKI development. Continuous data comparisons were analyzed via a student's t-test, and categorical data comparisons via a Fisher's exact test.

Results: There were 267 patients included in the analysis. For the primary outcome, 16/133 patients treated with V/PT experienced AKI, while 10/134 patients treated with V/C experienced AKI (12% vs. 7.5%, P=0.208). Median time to AKI was 3 days in V/PT group versus 2.5 days in the V/C group (P=0.47). There was no difference with patients in the V/PT group who had stage I AKI against the V/C group (9.8% vs. 2.3%, P=0.547). There was no difference between patients who had stage II AKI in the V/PT and V/C groups (2.3% vs. 0.7%, P=0.547). For the secondary endpoint of mortality, no difference was seen between patients the V/PT and V/C group (0.8% vs. 1.4%, P=0.566). Median length of stay was shorter in the V/PT group (8 days vs. 11 days, P=0.004.) In the V/C group, 90% of AKIs involved patients older than 65 while in the V/PT group, 62.5% of AKIs involved patients older than 65. In the V/PT group, 62.5% of
AKIs involved patients in the ICU while in the V/C group only 40% of AKIs involved patients in the ICU (P=0.422).

**Conclusions:** When comparing AKI incidence, there was no difference between patients on vancomycin with piperacillin/tazobactam and patients on vancomycin with cefepime. Results will be shared with stakeholders in antibiotic management, including the Antibiotic Committee.
Authors: Trent D Gray Jr. PharmD, MSPH, Alisha Mutch PharmD, BCPS, Natasha Advani PharmD, Molly Walbrown PharmD, BCPS, CACP, CDE

Title: CODEWAR: Impact of COVID19 Hospitalization on Warfarin Requirements

Objectives: The aim of this research project was to explore the association of hospitalization with COVID19 on daily warfarin requirements.

Methods: A retrospective chart review was performed within a community teaching health-system to explore the association of COVID19 on warfarin dosage requirements. A computer-generated report identified 291 laboratory-confirmed COVID19 positive adult patients previously established on warfarin therapy, who were admitted to one of seven WellSpan Health acute care facilities, from January 1st to December 31st, 2021. Patients were excluded if they required an interruption in warfarin therapy due to a procedure, discharged within 48 hours of admission, unable to ascertain an average daily dose of warfarin prior to admission (PTA), and/or treatment with a monoclonal antibody/convalescent plasma for COVID19. Included patients were stratified by age, BMI, and COVID19 treatment and assessed for differences in their PTA warfarin daily dosage requirement compared to in-patient (IP) requirements.

Results: Of the 121 patients included in the final analysis, the average dose reduction was 46% when comparing PTA daily dose of warfarin versus IP daily dose. The dosage reduction was consistent despite the presence of drug-drug interactions, confounding disease state variables such as chronic heart failure, active cancer, and hepatic impairment, or COVID19 treatment modality.

Conclusions: Based on this study, a 50% dosage reduction in previously established warfarin therapy may be warranted in adult, COVID19 positive in-patients admitted for at least 48 hours, who were not treated with outpatient monoclonal antibodies or convalescent plasma. Further large scale randomized clinical trials are needed to validate this finding.
**Conference Abstracts**

May 16-18, 2022

**Presenter Name:** Hammond, Jennifer  
**Organization:** Baystate Medical Center  
**Category:** Infectious Diseases  
**Day | Session | Room | Time:** Tuesday | 4 | Magnolia B | 3:30:00 PM

**Authors:** J. Hammond, M. Lorenzo; Baystate Medical Center, Springfield, Massachusetts

**Title:** Exploratory Analysis of Prescribing Practices for Inpatient Adults with Community Acquired Pneumonia

**Objectives:** Since the introduction of healthcare-associated pneumonia (HCAP) and its associated risk factors within the 2005 ATS/IDSA HAP/VAP/HCAP treatment guidelines, increased use of broad-spectrum antibiotics has resulted in many patients with community acquired pneumonia (CAP) without any apparent improvement in patient outcomes. Revised guidelines however recommend more selective use of broad-spectrum antimicrobials. The resulting paradigm shifts will require significant practice changes at most institutions, and evaluations of practice will assist antimicrobial stewardship teams in selecting areas for quality improvement. The purpose of this study is to evaluate adherence to current ATS/IDSA CAP treatment guidelines at Baystate Medical Center in adults hospitalized with CAP.

**Methods:** A retrospective chart review will be conducted of patients >20 years of age admitted for inpatient management of non-severe CAP between January 1, 2021 and March 31, 2021 with ICD10 codes J18.1 (lobar pneumonia unspecified) and J18.9 (pneumonia of unspecified organism) linked to their admission. Patients will be excluded if they: received <5 days of antimicrobial therapy, tested positive for COVID-19, were admitted to the intensive care unit, or were immunocompromised. Patient specific data points will be collected from the electronic medical record starting from admission date. Collected data points will include patient demographic information, CAP severity criteria, presence of HCAP risk factors, cultures and imaging obtained, antimicrobial use strategies, length of stay, and duration of antimicrobial therapy. Study data will be analyzed using descriptive statistics and reported using means and medians where appropriate.

**Results:** Results to be presented include the primary outcome of overall compliance in prescribing patterns based on recommendations published within the 2019 ATS/IDSA guidelines for management of inpatient adults with CAP. This is a composite endpoint consisting of three different subpoints: antimicrobial therapy, blood and sputum cultures, and radiographic imaging. Overall compliance with current guideline recommendations will be defined as compliance to all three subpoints.

**Conclusions:** It is anticipated that patients are often initiated on broad-spectrum antibiotic therapy without a clear indication during admission and management of CAP does not align with
recommendations published within current ATS/IDSA guidelines. Optimizing the inpatient management of CAP by following current treatment guidelines can prevent over-use of broad-spectrum antibiotic therapy, without compromising on patient safety and efficacy outcomes. Decreasing utilization of unnecessary imaging and lab testing will reduce overall healthcare cost and increase the quality of care delivered.
Conference Abstracts
May 16-18, 2022

Presenter Name: Hassani, Bessma
Organization: SBH Health System
Category: Infectious Diseases
Day | Session | Room | Time: Wednesday | 5 | Magnolia A | 1:45:00 PM

Authors: Bessma Hassani, PharmD, BCPS; Debra Willner, PharmD, BCIDP; Judith Berger, MD; Victoria Bengualid, MD

Title: Trends in antibiotic prescribing for gram-negative bloodstream infections before and after the implementation of a duration of therapy guide

Objectives: The emergence of antibiotic resistance is largely caused by the overuse of antibiotics; one strategy to abate the overuse of antibiotics is to treat bacterial infections with the shortest duration required to effectively eradicate the infection. Traditionally, uncomplicated gram-negative bloodstream infections were treated for 7 to 14 days, however recent retrospective studies and meta-analyses showed no difference in clinical outcomes between patients treated with shorter courses of antibiotics compared to longer courses. The objective of this study is to compare the duration of therapy of uncomplicated gram-negative bloodstream infections before and after implementation of a duration of therapy guide.

Methods: Medical records of patients admitted to SBH Health System with uncomplicated gram-negative bacteremia before and after the implementation of a duration of therapy guide on November 18, 2021 were reviewed. Patients were excluded if they had a polymicrobial infection, lack of source control, were immunocompromised, or had a source of bacteremia requiring longer durations of treatment (endocarditis, necrotizing fasciitis, osteomyelitis, central nervous system infection, empyema, or central venous catheter-related bloodstream infection). These exclusion criteria originate from prior trials assessing shorter durations of therapy for gram-negative bacteremia.

Results: The median and range of duration of therapy of antibiotics before and after the implementation of a duration of therapy guide will be recorded and results will be presented.

Conclusions: It is anticipated that the implementation of a duration of therapy guide at SBH Health System will appropriately shorten the duration of therapy for gram-negative bacteremia.
Presenters Name: Hepler, Andrew
Organization: WellSpan Waynesboro Hospital, WellSpan Chambersburg Hospital
Category: Infectious Diseases
Day | Session | Room | Time: Monday | 2 | Magnolia B | 3:00:00 PM

Authors: A. Hepler, J. Logsdon

Title: Daptomycin substituted for vancomycin in skin and skin structure infections: an assessment of clinical outcomes and cost

Objectives: Daptomycin is an effective alternative to vancomycin in MRSA infections. Daptomycin utilization has historically been limited due to cost, but generic competition has led to significant cost reductions. The intent of this study is to assess cost savings and outcomes resulting from a substitution policy for daptomycin in place of vancomycin for the treatment of cellulitis.

Methods: This multicenter, retrospective, observational study was approved by the Institutional Review Board of WellSpan Health. Patients were analyzed via retrospective chart review who received vancomycin from January 2021 to July 2021 and daptomycin from August 2021 to January 2022 for skin and skin structure infections. Primary outcomes assessed include occurrence of acute kidney injury (defined by a serum creatinine increase ≥0.3mg/dL within 48 hours or ≥1.5x baseline serum creatinine) and length of stay (measured as whole days). Secondary outcomes assessed include 30-day readmission rate and incidence of rhabdomyolysis. Cost analyses compared average drug cost, pertinent lab cost, pharmacy time, and nursing time spent per patient. Patients were excluded if they were <18 years old, received less than one day of therapy, or had end stage renal disease listed as a diagnosis.

Results: A total of 295 patients were included in this retrospective analysis. AKI was experienced in 9 patients receiving vancomycin and 2 patients receiving daptomycin (6.16% v. 1.34%; P=0.0337). Length of stay was similar between both vancomycin and daptomycin treatment groups (5.5 days v. 5.8 days; P=0.5692, 95%CI [-0.73-1.33]). Readmission rates for daptomycin were numerically lower for both 30-day all cause readmission (18.79% v. 24.66%; P=0.2589) and cellulitis related readmission (9.4% v. 13.01%; P=0.3594), although not statistically significant. Rhabdomyolysis was discovered in one patient taking daptomycin, although creatine kinase levels were elevated prior to therapy initiation. Average cost of care per patient was $130.15 for daptomycin therapy and $152.82 for vancomycin.

Conclusions: In patients treated for skin and skin structure infections, daptomycin displayed significant reductions in acute kidney injury compared to vancomycin. There were no significant differences in length of stay or readmission rates between agents, although daptomycin...
readmission rates were numerically lower. Daptomycin therapy may be considered as a cost-effective option for the treatment of skin and skin structure infections.
Clinical impact of pharmacist-led penicillin allergy de-labeling

**Authors:** S. Hewady, PharmD; N. Mulvey, PharmD; M. Ahmed, PharmD BCPS

**Title:** Clinical impact of pharmacist-led penicillin allergy de-labeling

**Objectives:** Approximately 10% of the US population have documented penicillin allergies, with only 5% of reported allergies being classified as a true allergy. This mislabeling propagates the use of alternative broad spectrum antibiotic regimens which ultimately leads to multi-drug resistance, increased length of stay, and diminished patient outcomes. The purpose of this study is to evaluate the clinical impact of pharmacist-led penicillin allergy de-labeling on antimicrobial optimization and assess the accuracy of noted allergies.

**Methods:** This was a single-center, retrospective/prospective cohort study with a data collection period of 2 months for each study period. In both cohorts, electronic medical records were utilized to extract information about patients’ allergies, bacterial infections, and antimicrobial regimens. In the retrospective cohort, patient antibiotic courses were reviewed and analyzed for optimization and in the prospective cohort, a penicillin allergy questionnaire was administered, followed by active therapy optimization based on questionnaire results. The primary endpoint of this study was de-escalation from non-penicillin or non-cephalosporin broad spectrum antibiotics to the preferred penicillin or cephalosporin therapy; secondary endpoints included accuracy of noted reaction, allergy de-labeling, and ability to correct/elaborate upon the noted allergic reaction.

**Results:** Each cohort had 30 patients for a total study population of 60 patients. The administration of pharmacist-led penicillin allergy questionnaire resulted in increased rates of antibiotic de-escalation in the prospective cohort when compared to the retrospective cohort (20% vs 13% respectively). Allergy de-labeling occurred in 23.3% of patients in the prospective cohort. Inaccuracies were identified in 43.3% of documented allergies and 92% of these inaccuracies were corrected. Implementation of pharmacist-led penicillin allergy questionnaire allowed for inclusion of reaction onset, severity, and previous tolerance information for 83.3% of studied patients.

**Conclusions:** Penicillin allergy mislabeling prompts the use of suboptimal antimicrobial regimens and potentiates the emergence of multidrug resistant organisms. The use of second-line antibiotics can lead to poor outcomes regarding the infectious condition being treated as well as serious adverse effects associated with said therapies. Incorporation of penicillin allergy
questionnaire into allergy information documentation is a minor intervention that can optimize patient safety and outcomes.
Authors: Sheshadri Hoque, PharmD; Anthony Nowling, PharmD; Apexa Patel; Stacie Deslich; Meredith Todd, PharmD, BCPS, BCIDP

Title: Time to De-escalation Post Accelerate Pheno® System Implementation in Patients with Gram-Negative Bacteremia

Objectives: The increase of intravenous drug use in the United States has resulted in higher prevalence of bacteremia requiring empiric broad-spectrum antimicrobial administration. With advancements of polymerase chain reaction testing including the Accelerate Pheno® System, blood-culture organism identification and minimum inhibitory concentration for specific antibiotics can be available quicker than traditional bacterial culture and provides the opportunity to de-escalate antimicrobial therapy faster. This study aims to assess the effects of this testing modality on antimicrobial therapy de-escalation for gram-negative bacteremia. The information provided may drive institutional policy, explore future use of the technology, and clarify effects of its implementation.

Methods: This study consists of a quasi-experimental design that compares two cohorts, patients receiving treatment for gram-negative bacteremia before and after the Accelerate Pheno® system implementation on September 22, 2021. Methods include a retrospective chart review of all patients with gram-negative bacteremia admitted to one of the Charleston Area Medical Center (CAMC) hospitals between September 1, 2019, and September 20, 2021. The primary outcome assesses the difference in time to de-escalation of antibiotic therapy post phenotypic testing implementation. Secondary outcomes assess the total duration of antimicrobial treatment, the rates of Clostridium difficile infection before and after implementation, and the percentage of isolates that must be cultured by traditional methods due to the inability of the panel to determine all needed susceptibility results.

Results: The time to de-escalation in the pre- and post-implementation groups were 57.9 hours and 51.1 hours, respectively (p = 0.0281). This illustrates improvement in the time to targeted antimicrobial therapy for patient with gram negative bacteremia at CAMC. There were no differences found in the incidence of Clostridium difficile infection or in the total antibiotic therapy duration. Additional susceptibility testing was performed in 25% of samples.

Conclusions: Due to these findings our contract with the Accelerate Pheno® technology was not renewed.
Conference Abstracts  
May 16-18, 2022

Presenter Name: Hughes, Frances  
Organization: Montefiore Medical Center, Bronx, New York  
Category: Infectious Diseases  
Day | Session | Room | Time: Wednesday | 5 | Magnolia B | 2:00:00 PM

Authors: F. Hughes, M. Chang, H. Bao, P. Goriacko, R. Bartash, Y. Guo; Montefiore Medical Center, Bronx, New York  
Title: Real world efficacy of fidaxomicin in patients at risk of recurrence  
Objectives: This study compares the outcomes of fidaxomicin and vancomycin treatment in high-risk patients with at least 1 recurrence of Clostridiodes difficile infection (CDI).  
Methods: This was an observational matched-cohort study that reviewed patient admissions for recurrent CDI from January 2016 to November 2021 at a regional academic medical center. Admissions were included if the patient received fidaxomicin or oral vancomycin for at least 5 days and had at least one of the following risk factors: age greater than or equal to 70, history of bone marrow or solid organ transplant, treatment with antineoplastics within 30 days, and/or previous antibiotics within 30 days. Fulminant infection or a history of failed oral vancomycin taper were excluded. An exact match between fidaxomicin and vancomycin patients was performed on previous recurrences, risk factors, and year of admission. The primary endpoint was the incidence of readmission within 90 days for CDI. Secondary endpoints include the incidence of a healthcare encounter (ED, clinic, or admission) and mortality within 90 days of discharge.  
Results: The number and percentage of readmissions, healthcare encounters, and mortalities for each treatment group based on number of patient risk factors will be analyzed.  
Conclusions: It is anticipated that this project will evaluate outcomes including readmission rates and mortality in patients receiving vancomycin or fidaxomicin and help demonstrate the optimal treatment for high-risk patients with multiple recurrent infectious episodes of C. difficile in a real-world setting. We hypothesize that high-risk patients with at least one recurrence of C.difficile receiving fidaxomicin will have a lower readmission rate within 90 days compared to the vancomycin cohort.
Impact of a Pharmacist-Driven Antimicrobial Stewardship Initiative on Antibiotic Duration of Therapy in Hospitalized Patients with Community-Acquired Pneumonia

Objectives: Pneumonia has a significant impact on morbidity and mortality. In 2019, the American Thoracic Society (ATS) and Infectious Diseases Society of America (IDSA) released an updated clinical practice guideline for the management of community-acquired pneumonia (CAP) in adult patients. There are also guideline recommendations pertaining to antimicrobial stewardship and the role pharmacists play in conducting stewardship activities. The purpose of the study is to determine if a pharmacist-driven antimicrobial stewardship initiative aligned with guideline recommendations can successfully limit patient exposure to unnecessary, prolonged courses of broad-spectrum antibiotics in adult patients hospitalized with CAP.

Methods: The study was conducted as a single-center, observational, comparative study evaluating the impact of the stewardship initiative. A retrospective chart review was conducted prior to the initiative; results from the pre-implementation phase were compared to a prospective chart review following implementation of the stewardship activities. Adult inpatients presenting from the community setting who received antibiotics for the treatment of pneumonia and who started antibiotics within 48 hours of hospital presentation were included.

Results: The primary endpoint was the average duration of antibiotic therapy from the pre- and post-implementation phases (7.7 vs 5.8 days, p=0.0002). No clinically significant difference was determined for intravenous antibiotic duration of therapy, hospital length of stay, and 30-day readmission rate. There was overall less antibiotic exposure in the post-implementation phase.

Conclusions: Based on the results of this study, a pharmacist-driven antimicrobial stewardship initiative successfully limited antibiotic exposure during CAP treatment without impacting 30-day hospital readmission rates.
Comparison of insulin glargine vs. NPH for glycemic control in medical ICU patients

**Objectives:** Glycemic control is vital in the management of medical intensive care unit (MICU) patients with a variety of insulin formulations available to consider. Given ICU patients' rapidly changing and unpredictable insulin requirements, the use of intermediate-acting insulin, such as insulin NPH, may provide improved flexibility in dose adjustments and improved glycemic control as compared to long-acting insulin glargine. The objective of this study was to compare insulin glargine vs. insulin NPH for glycemic control in MICU patients at two academic medical centers.

**Methods:** This retrospective cohort study included adult patients admitted to the MICU at two academic medical centers between July 1, 2019 and June 30, 2021. Patients were included if they received insulin glargine or insulin NPH during their ICU admission. Exclusion criteria included diagnosis of diabetic ketoacidosis or hyperosmolar hyperglycemic state or administration of an insulin infusion during admission. The primary endpoint was the percentage of blood glucose readings within goal range, defined as 70 – 180 mg/dL. Secondary endpoints included time from insulin initiation to two consecutive blood glucose readings within goal range, percentage of blood glucose values below 70 mg/dL or above 180 mg/dL, percentage of insulin doses held, and number of dose adjustments.

**Results:** A total of 87 patients were included in the analysis, of which 60 patients received insulin glargine and 27 received insulin NPH. The median percentage of blood glucose readings within goal range (70 – 180 mg/dL) per patient was 50% (IQR 27.5, 66.5) vs. 69.8% (IQR 48.8, 79.1) in the glargine vs. NPH groups, respectively. Median time from insulin initiation to two consecutive blood glucose readings in goal range was shorter in the insulin NPH group (32.2 [IQR 7.9, 65.3] vs. 27 [IQR 12.3, 42.1] hours). Median percentage of blood glucose values above 180 mg/dL per patient was also lower in the NPH group (47.7% [IQR 30.8, 72.5] vs. 30.2% [IQR 20.9, 50]). Median percentage of blood glucose readings below 70 mg/dL per patient was similar between the two groups (0% [IQR 0, 0] vs 0% [IQR 0, 0]).

**Conclusions:** Insulin NPH was associated with overall improved glycemic control and faster time to achievement of blood glucose goals as compared to insulin glargine. When designing a
subcutaneous insulin regimen for MICU patients, it may be appropriate to consider insulin NPH due to a pharmacokinetic profile more suitable to a critically ill population.
**Presenter Name:** Javadi, Romina  
**Organization:** SBH Health System  
**Category:** Infectious Diseases  
**Day | Session | Room | Time:** Monday | 2 | Magnolia B | 3:15:00 PM

**Authors:** R Javadi, D. Willner, V. Bengualid; SBH Health System, Bronx, New York

**Title:** Impact of a pharmacy-driven vancomycin dosing and monitoring program

**Objectives:** Vancomycin is a glycopeptide antibiotic that is commonly used in the treatment of gram-positive infections. Optimal serum vancomycin trough concentrations are required to ensure improvement in clinical outcomes, reduce the emergence of resistance, and prevent undesired adverse events. Studies have shown that pharmacist-driven therapeutic vancomycin monitoring can increase rates of clinical efficacy and decrease the rates of nephrotoxicity. The objective of this study is to evaluate the impact of a vancomycin pharmacist-driven therapeutic drug monitoring (TDM) program

**Methods:** Medical records of patients treated with vancomycin from November 1st, 2020-February 28th, 2022 were reviewed. In this study, patients ≥ 18 years of age and older receiving vancomycin for at least 72 hours and had at least one serum vancomycin value were included. Patients <18 years of age, individuals who received vancomycin for less than 72 hours and those with End Stage Renal Disease (ESRD) were excluded

**Results:** The following measures will be assessed: time to therapeutic troughs, incidence of acute kidney injury, and duration of therapy for 3 different time periods: pre-implementation, and post two TDM-related interventions

**Conclusions:** It is anticipated that the results of this project will show a significant reduction in the incidence of acute kidney injury and a faster achievement of the therapeutic troughs
Short vs. prolonged therapy for ventilator-associated pneumonia caused by non-lactose fermenting gram-negative rods in critically ill patients

Objectives: Ventilator-associated pneumonia (VAP) can be associated with increased morbidity and mortality. Empiric treatment with the appropriate antibiotics and optimal duration is imperative for improved outcomes. Current treatment guidelines recommend 7 days of therapy based on evidence demonstrating that short courses of antibiotics reduce antibiotic exposure and recurrent pneumonia due to multi-drug resistant organisms (MDRO). However, in a subset of patients whose pneumonia is caused by non-lactose fermenting gram-negative (NLFGN) organisms, treatment with shorter courses is associated with a risk of recurrent infection. The objective of our study is to compare short (≤ 7 days) versus prolonged (> 7 days) therapy for VAP caused by NLFGN organisms.

Methods: This is an IRB-approved, retrospective study of adult patients admitted to the intensive care unit (ICU) at NYU Langone Health Tisch and Brooklyn campuses between January 2013 and December 2019 and diagnosed with their first incidence of VAP. Patients were included if they were mechanically ventilated for at least 48 hours with a positive sputum culture due to NLFGN organisms. Patient demographics, past medical history, comorbidities, microbiologic laboratory data, and treatment details (antibiotics, dose, frequency, duration) were collected. Outcomes were compared between short and prolonged therapy, rate of recurrence of infection, the emergence of MDRO within 30 days of VAP treatment, 30-day readmission, Clostridiodes difficile infection, and in-hospital mortality.

Results: The number and percentage of clinical cure, duration of therapy, the emergence of resistance, duration of mechanical ventilation, length of hospital stay, length of ICU stay, and all-cause in-hospital mortality will be recorded, and results will be presented.

Conclusions: It is anticipated that short courses of therapy will be sufficient for VAP caused by NLFGN organisms and promote better antimicrobial stewardship.
Conference Abstracts
May 16-18, 2022

Presenter Name: Kaur, Amandeep
Organization: Guthrie Robert Packer Hospital
Category: Infectious Diseases
Day | Session | Room | Time: Monday | 1 | Magnolia A | 12:45:00 PM

Authors: Amandeep Kaur, PharmD; Karen S. Williams, PharmD, BCPS-AQ ID; Laura J. Walker, DO

Title: Improving Harm Reduction Services in People who Inject Drugs at a Rural Health System

Objectives: Hospitalists are increasingly responsible for the management of infectious consequences of opioid use disorder, including increasing rates of endocarditis, osteomyelitis, and soft tissue infections associated with injection-drug use. The complications related to unsafe injection practices often lead to requiring acute care in the emergency department or in-patient treatment. Despite the substantial risk of complications leading to hospitalizations among people who inject drugs, harm reduction interventions have not been widely adopted in inpatient settings. The objective of this study was to assess the need for a multi-modal approach as a quality improvement process for standard of care and to evaluate the impact of a pharmacist-led education for healthcare providers to improve access to harm reduction services.

Methods: A review of medical records assessed the need for a multi-modal intervention to increase access of harm reduction services as a quality improvement. Patients over the age of eighteen who inject drugs that presented to the emergency department or are hospitalized were eligible. After clinician education and implementation of an order set with a discharge bundle, investigators utilized prospective audit to assess and re-educate on use of the bundle. The primary outcome measure was a quantitative measure of Narcan prescriptions or education provided at discharge. The secondary outcome measures were quantitative measures of disease screening (HIV, hepatitis B and C), vaccination rates (hepatitis A and B, influenza, tetanus, pneumococcus), fentanyl test strips education, safe injection practice education, and discharge instructions that contain outpatient resources (syringe exchange programs, substance use disorder clinic referrals). Analysis of survey data pre and post pharmacist-led education of naloxone nasal spray to healthcare providers was also included as a secondary outcome.

Results: A total of sixty-five patients were reviewed retrospectively to assess the need for increased access of harm reduction services. The primary and secondary outcomes will be assessed before and after implementation of the multi-modal intervention. Likert-scale surveys were conducted to gather baseline confidence with naloxone knowledge and dispensing in healthcare providers. A total of twenty-three survey responses were received for the initial baseline assessment. A follow-up Likert-scale survey is currently being conducted to assess for...
change in confidence with naloxone knowledge and dispensing after naloxone education. The results will be presented.

**Conclusions:** It is anticipated that there is a lack of harm reduction services being provided to the population of people who inject drugs. It is also anticipated that a multi-modal approach will increase access to harm reduction services in people who inject drugs in a rural hospital system.
Authors: B. Kennedy, C. McLellan, A. Krevat; Emerson Hospital, Concord, Massachusetts

Title: Determining local risk factors for Pseudomonas aeruginosa pneumonia at a community hospital

Objectives: Patients presenting with community-acquired pneumonia (CAP) are usually spared coverage of resistant organisms, such as Pseudomonas aeruginosa, that are thought to be uncommon in the community. Recent updates to the Infectious Diseases Society of America and American Thoracic Society's guidelines on community-acquired and hospital acquired/ventilator associated pneumonia recommend creating locally validated risk factors. This is to help guide empiric coverage to identify patients most at risk who may require broader initial anti-pseudomonal coverage. The purpose of this project is to identify local risk factors for P. aeruginosa pneumonia at this community hospital and create a risk algorithm to guide empiric antibiotic coverage.

Methods: This is a single-center, retrospective, case-control study of adult hospitalized patients admitted between January 1, 2017 and September 30, 2021. Patients were included if they were at least 18 years of age, had an ICD-10 code or suspected diagnosis for pneumonia in the medical record, and had a positive sputum culture, Legionella urinary antigen, Mycoplasma pneumoniae polymerase chain reaction (PCR), or Chlamydia pneumoniae PCR. Identified patients were divided into two groups: patients with a positive microbiology result for P. aeruginosa, or patients with a non-pseudomonal sample (including normal respiratory flora) and were matched in a 1:2 ratio based on age, gender, and year of admission. Chi-squared tests and Fisher's exact tests were used to identify significant risk factors.

Results: A total of 138 patients met the inclusion criteria (n = 46 P. aeruginosa, n = 92 non-P. aeruginosa). The following factors were associated with an increased risk for P. aeruginosa pneumonia if they occurred within 12 months prior to the analyzed admission: previous culture positive for P. aeruginosa from any site (p = 0.032, OR = 5.33, [95% CI 1.31-21.7]), hospitalization (p = 0.008, OR = 2.77 [1.29-5.93]), emergency room visit only (p = 0.021, OR = 2.43 [1.14-5.20]), both hospitalization and emergency room visit (p = 0.006, OR = 2.84 [1.34-6.02]), and hospitalization over two or more days (p = 0.001, OR = 3.27 [1.55-6.90]).

Conclusions: Patients admitted with suspicion of pneumonia with previous P. aeruginosa cultures from any site, hospitalizations and/or emergency room visits, or hospitalizations lasting two or more days in the 12 months leading up to their admission were significantly more likely to
be diagnosed with P. aeruginosa pneumonia. Patients with these risk factors would most likely benefit from empiric anti-pseudomonal coverage. This data will be further reviewed to create a site-specific algorithm to guide empiric anti-pseudomonal coverage for community-acquired pneumonia.
**Conference Abstracts**
May 16-18, 2022

**Presenter Name:** Kim, Zachary  
**Organization:** ChristianaCare Health System  
**Category:** Infectious Diseases  
**Day | Session | Room | Time:** Tuesday | 4 | Magnolia B | 4:00:00 PM

**Authors:** Z Kim, C Clayton, J Leri, N Harrington  
**Title:** Evaluation of Cefepime or Piperacillin-tazobactam for the Treatment of ESBL-E Cystitis and Pyelonephritis

**Objectives:** The CDC 2019 report on antibiotic resistance considers extended spectrum ß-lactamase-producing Enterobacterales (ESBL-E) a serious threat. Many ß-lactam antibiotics are ineffective against ESBL-E except for carbapenems, which are endorsed by the 2022 IDSA resistant Gram-negative guideline as the drugs of choice. Other ß-lactam antibiotics such as cefepime and piperacillin-tazobactam are used for ESBL-E, but worse outcomes have been reported. The IDSA guidelines only endorse cefepime and piperacillin-tazobactam for ESBL-E infections if treating cystitis and clinical improvement is noted. Many hospitals, including ChristianaCare, do not report ESBL production tests and instead follow susceptibility data. Cefepime and piperacillin-tazobactam may be prescribed for isolates that result as sensitive and are ESBL positive. The primary purpose of this study was to evaluate clinical outcomes in patients with ESBL-E cystitis and pyelonephritis treated with cefepime or piperacillin-tazobactam.

**Methods:** This was a single center, retrospective, descriptive, cohort study in a 1,200-bed community teaching health system. Adult patients with ESBL positive urine culture results between July 1st, 2020 and July 1st, 2021 who were treated with cefepime or piperacillin-tazobactam were evaluated. Patients were identified using microbiology lab data with ESBL production detected via VITEK 2. The primary outcome was clinical cure at conclusion of treatment or at hospital discharge. Secondary outcomes included appropriateness of antibiotic dose and duration, readmission rates, presence of infectious disease consult, and minimum inhibitory concentration.

**Results:** 565 patients were identified with ESBL positive urine culture results. Following application of the exclusion criteria, 54 patients were included in the final analysis. The most common reason for exclusion was treatment with an antibiotic other than cefepime or piperacillin-tazobactam. Types of urinary tract infection (UTI) included 10 cases of uncomplicated UTI, 42 cases of complicated UTI, and 2 cases of pyelonephritis. In the final cohort, 35 patients were treated with cefepime while 19 were treated with piperacillin-tazobactam. The primary outcome of clinical cure was achieved in 91% (49/54) of patients. When stratified by antibiotic, clinical cure occurred in 86% (31/35) of patients treated with...
cefepime and 95% (18/19) of patients treated with piperacillin-tazobactam. Of the patients who did not reach clinical cure, 80% (4/5) were male.

**Conclusions:** The rate of clinical cure was shown to be acceptable in patients with ESBL-E urinary tract infections treated with cefepime or piperacillin-tazobactam, with similar rates in both treatment groups. No major changes to this institution's urinary tract infection guidelines or ESBL production test reporting practices are anticipated.
Conference Abstracts
May 16-18, 2022

Presenter Name: Komandt, Mary
Organization: Johns Hopkins Home Care Group; Johns Hopkins Hospital; Baltimore, MD
Category: Infectious Diseases
Day | Session | Room | Time: Poster

Authors: M. Komandt, V. Gilmore, C. Kilcrease, M. Lengel, S. Canfield

Title: Correlation between medication adherence using proportion of days covered and achieving viral suppression in patients living with HIV

Objectives: This project intended to determine if there is a difference in the odds of achieving viral suppression with a proportion of days covered (PDC) > 90% compared to patients with lower levels of PDC. Additionally, this project intends to determine if demographic factors including age, ethnicity, sex, primary antiretroviral (ARV) regimen type, payer type, primary pharmacy location, and refill assistance program (RAP) enrollment impact the odds of achieving viral suppression.

Methods: This retrospective observational study which was performed using prescription dispensing data and electronic medical records (EMR) included patients who (1) were 18 years or older, (2) were diagnosed with HIV, (3) had at least two occurrences of dispensed antiretrovirals between July 1, 2020 and June 30, 2021 at any of the Johns Hopkins Outpatient Pharmacy (JHOP) locations, and (4) had at least one HIV RNA viral load reported in EMR from the same time frame. PDC was calculated at the generic product identifier (GPI) level. For patients receiving multiple GPI in time period, a weighted average PDC was calculated. Logistic regression analysis will be performed and odds ratios calculated with 95% confidence for each demographic factor to determine correlation with viral suppression.

Results: Preliminary results to be presented at The Eastern States Residency Conference.

Conclusions: It is anticipated this project will demonstrate the level of adherence to HIV medications which is needed to reasonably anticipate viral suppression. Additional conclusions will be drawn regarding additional demographic factors and their impact on viral suppression.
Piperacillin-tazobactam versus meropenem or cefepime for the treatment of bacteremia due to AmpC beta-lactamase-producing organisms

Objectives: Enterobacter cloacae complex, Klebsiella aerogenes, Citrobacter freundii, Serratia marcescens, Morganella morganii, and Providencia species are known to harbor chromosomal AmpC beta-lactamases. Exposure to certain beta-lactams can cause inducible resistance to third generation cephalosporins. While carbapenems have been regarded as first line agents for these organisms there has been growing interest in carbapenem-sparing therapies. Cefepime has shown comparable efficacy to carbapenems, but evidence for piperacillin-tazobactam has been limited. Recent guidelines recommend against use of piperacillin-tazobactam for serious infections due to these organisms based on in vitro data and limited observational studies. This study compared the outcomes of patients receiving piperacillin-tazobactam versus meropenem or cefepime for the treatment of bacteremia caused by AmpC-producing organisms.

Methods: This was a single-center, retrospective study of patients with bacteremia caused by AmpC-producing organisms between October 1, 2012 to August 31, 2021. Patients were included if they were 18 years of age or older, had at least one positive blood culture with an AmpC-producing organism demonstrating a wild-type susceptibility pattern, and received definitive therapy with piperacillin-tazobactam, cefepime or meropenem for at least 72 hours within 5 days of the index blood culture. Exclusion criteria included polymicrobial infection or concomitant use of another antibiotic with in vitro activity against the infecting organism for at least 72 hours. The primary endpoint was the presence of clinical and microbiologic resolution, defined as resolution of fever and leukocytosis and sterilization of blood cultures within five days of index blood culture. Secondary endpoints included persistent bacteremia, inpatient mortality, time to clinical and microbiologic resolution, and conversion to derepressed phenotype on subsequent blood cultures.

Results: One hundred patients were included with 60, 35 and 5 patients treated with piperacillin-tazobactam, meropenem and cefepime, respectively. The most common infecting organisms were Enterobacter cloacae (48%) and Serratia marcescens (30%). Thirty-eight (95%) patients in the meropenem and cefepime group had clinical and microbiologic resolution within 5 days of index blood culture compared to 56 (98%) in the piperacillin-tazobactam group [p=0.416]. No significant differences were identified in the secondary endpoints.
**Conclusions:** Treatment with piperacillin-tazobactam yielded similar rates of clinical and microbiologic resolution for bacteremia due to AmpC-producing organisms compared with meropenem or cefepime. Large randomized controlled trials are needed to validate these findings.
Evaluation of post-discharge sterile-site positive microbiology results and the impacts on patient care

**Objectives:** Approximately 41% of patients have cultures pending at discharge. Failure to address these results may delay diagnosis and appropriate initiation or change in antimicrobials. Primary objective was to determine the prevalence of patients warranting antimicrobial intervention with positive sterile-site microbiology cultures resulting post-discharge. Secondary objectives included evaluating the incidence and timeliness of documentation and 30-day hospital readmission. It was theorized that patients with positive cultures resulting post-discharge who do not have acknowledgment of finalized results are likely to receive antimicrobial therapy that warrants intervention, leading to increases in hospital readmissions.

**Methods:** This retrospective observational cohort study evaluated patients from 7/1/2019-12/31/2019 with positive sterile-site microbiologic cultures resulting post-discharge. Pertinent inclusion and exclusion factors included inpatient admission ≥48 hours and non-sterile sites (i.e. urine, bronchoalveolar lavage cultures), respectively. Statistical analysis was completed with SPSS using appropriate statistical tests based on data type. Binary multivariable logistic regression with assessment for statistical interaction was completed for 30-day hospital readmission stratified by infectious disease (ID) team involvement.

**Results:** 208 of 768 patients screened were included. Blood was the most common type of culture with 61 patients (29.3%). Additionally, 107 (51%) patients had inpatient ID consults. Antimicrobial intervention was warranted in 76 (36.5%) patients based on finalized culture results, with antimicrobial escalation being most common (81.5%). Overall, 74 (35.6%) patients had documentation of acknowledgment of result finalization. Rates of documentation were overall low, though noted to be higher in patients warranting intervention (47.4% vs. 28.8%, P = 0.007). Time to documentation was also statistically significantly shorter in patients warranting intervention (4 days vs. 9 days, P = 0.039). Notably, rates of hospital readmission were higher in patients warranting intervention (32.9% vs 22.7%, P = 0.109). Logistic regression found 30-day readmission was significantly less likely to occur when results were documented in patients not being followed by ID (OR 0.186; 95% CI, 0.07-0.53).
**Conclusions:** A significant number of patients with cultures finalized post-discharge warrant antimicrobial intervention. Documentation of acknowledgment of result finalization can decrease the risk of 30-day hospital readmission, especially in patients not followed by ID. Future quality improvement efforts should focus on methods to improve documentation and follow-up of pending culture results to improve patient outcomes.
Conference Abstracts
May 16-18, 2022

Presenter Name: Lichardi, Michael
Organization: Ocean University Medical Center; Southern Ocean Medical Center
Category: Infectious Diseases
Day | Session | Room | Time: Monday | 2 | Magnolia B | 4:00:00 PM

Authors: M. Lichardi, Y. Nissim, E. Pelczar, D. Nayyar

Title: Evaluation of a multi-site pharmacist to dose vancomycin pilot program

Objectives: Therapeutic drug monitoring and dose adjustments by pharmacists of medications, such as vancomycin, have become more common in the clinical setting. Recent studies have shown that vancomycin goal troughs are achieved more rapidly with pharmacy directed dosing strategies than when dosed by physicians. Other studies have shown that pharmacist led vancomycin dosing is as effective as physician led vancomycin dosing and can therefore reduce the workload of physicians, increasing satisfaction. The purpose of this study is to determine whether a pharmacist-led vancomycin dosing protocol will improve vancomycin use at two medical centers.

Methods: Medical records of patients included in a pharmacist to dose vancomycin pilot program in the Critical Care Unit of OUMC and at SOMC, as well as the control group, were evaluated to determine the time until optimization of the patients' vancomycin doses, defined as achieving a serum vancomycin trough concentration of 10-20 ug/L or 15-20 ug/L depending on the indication of therapy selected by the prescribing physician, when dosed and monitored by a pharmacist compared to other services. These patients were also evaluated to identify incidences of vancomycin induced nephrotoxicity, defined as an increase in SCr of ≥0.3 mg/dL over a 48-hour period while on vancomycin therapy with no other apparent cause, as well as for the appropriateness of vancomycin prescribing and ordering, defined as using weight-based initial dosing, selecting appropriate trough goals based on indications, selecting an appropriate frequency based on the patients' renal functions, and deescalating treatment when appropriate as cultures become available. These two groups were directly compared using descriptive statistics and the results were analyzed for statistical significance using a student t-test.

Results: The mean time to achieve the selected goal vancomycin serum trough level in the pharmacist dosed population compared to patients with vancomycin dosed and monitored by other services will be reported, as well as the mentioned secondary objectives.

Conclusions: It is anticipated that this project will demonstrate a role for pharmacist-based vancomycin dosing and monitoring at OUMC and SOMC in order to optimize patients' treatment of susceptible bacterial infections.
Presenter Name: Macaspac, Christian  
Organization: VA Maryland Health Care System  
Category: Infectious Diseases  
Day | Session | Room | Time: Monday | 2 | Magnolia C | 3:30:00 PM

Authors: C. Macaspac, G. Yugov, K. Perez; VA Maryland Health Care System, Baltimore, Maryland

Title: Characterizing the use of bismuth-based therapy for helicobacter pylori at a veterans affairs medical center

Objectives: Helicobacter pylori (H. pylori) is a common infection that leads to comorbidities such as peptic ulcer disease, dyspepsia, and gastric cancer. With a growing rate of antibiotic resistance and limited treatment options, it is imperative to establish an effective treatment regimen. The most common cause of treatment failure for first-line treatment, is because of nonadherence, which can be affected by various factors including regimen complexity. This quality improvement project investigates whether a regimen that combines three antibiotics into one dosage unit versus providing the three antibiotics individually, would improve adherence and treatment outcomes at a Veterans Affairs Medical Center.

Methods: This project is a retrospective cohort study that will compare the VA Maryland Health Care System (VAMHCS) population that received separate administration of bismuth quadruple therapy (sBQT) to patients that received the combined bismuth quadruple therapy (cBQT). To be included, patients will have tested positive for H. pylori and received treatment using either cBQT or sBQT. Data for cBQT and sBQT will be collected from 2017 and 2020, respectively, as these were the years when they were the primary BQT regimen at VAMHCS. Patient populations will be compared based on treatment failure rates, which will be assessed using re-testing and/or re-treatment data. This project also investigates risk factors that contributed to treatment failure by documenting the number of times a risk factor was present when treatment failure occurred. These risk factors include side effects, missed doses, early discontinuation, baseline age, number of other medications, and inappropriate treatment. Lastly, this study will assess the appropriateness of sBQT treatment regimens prescribed at VAMHCS based on the American College of Gastroenterology (ACG) 2017 guidelines.

Results: The number and percentage of treatment failures that occurred with respect to the type of regimen (sBQT or cBQT) will be recorded. Additionally, the number of incidences a risk factor was present when treatment failure occurred will be documented. Lastly, the percentage of times VAMHCS providers prescribed sBQT appropriately will be documented.

Conclusions: It is anticipated that this project will identify differences in treatment efficacy, if any, in patients that have received Bismuth Quadruple Therapy administered as combined or
separated dosage formulations. It will identify risk factors that increase the risk of treatment failure and assess VAMHCS providers' compliance with the ACG guidelines.
Conference Abstracts
May 16-18, 2022

Presenter Name: Medved, Ryan
Organization: Walter Reed National Military Medical Center (WRNMMC), Bethesda, Maryland
Category: Infectious Diseases
Day | Session | Room | Time: Wednesday | 5 | Magnolia A | 12:30:00 PM

Authors: R. Medved, S. Cooper, M. Ayalew, V. Costello

Title: Evaluation of Methicillin-Resistant Staphylococcus aureus Nares Polymerase Chain Reaction to De-escalate Vancomycin within a Military Medical Treatment Facility

Objectives: Vancomycin is a commonly prescribed antibiotic used for the empiric coverage for methicillin-resistant Staphylococcus aureus (MRSA) pneumonia. There are concerns that the overuse of vancomycin exposes patients to an increased risk for adverse effects as well as increasing the potential for multi-drug resistance organisms to emerge. Assessing the impacts of a hospital-wide pharmacist-driven protocol that uses MRSA nares polymerase chain reaction (PCR) to de-escalate vancomycin therapy in patients started on empiric therapy for suspected pneumonia is an important step in reducing adverse events and improving antimicrobial stewardship standards.

Methods: This was a prospective, single-center, pre-post implementation study that took place over three months (JAN-MAR 2022). Patients were included in the study if they were started on vancomycin therapy and had a diagnosis of pneumonia. For patients that met inclusion, an order for MRSA nares PCR was entered in the electronic health record by the pharmacist to be cosigned at the start of vancomycin therapy (if not already ordered by the physician). Vancomycin de-escalation was recommended if MRSA nares PCR came back negative with no other suspected source. Primary outcome was time to discontinuation. Secondary outcomes were acceptance and declination rate for all vancomycin orders after a negative MRSA nares PCR, and the occurrence of vancomycin-induced nephrotoxicity (VIN) in patients for which de-escalation had been declined.

Results: The average time for de-escalation and percentage of acceptance rate will be recorded and results will be presented.

Conclusions: It is anticipated that this project will demonstrate that a pharmacist-driven MRSA nasal PCR screening protocol will be associated with a decreased duration of vancomycin and reduce the risk of adverse events.
**Conference Abstracts**  
May 16-18, 2022

**Presenter Name:** Menditto, Melissa  
**Organization:** Dartmouth-Hitchcock Medical Center  
**Category:** Infectious Diseases  
**Day | Session | Room | Time:** Tuesday | 3 | Magnolia C | 12:45:00 PM

**Authors:** M. Menditto, C. Worby; Dartmouth-Hitchcock Medical Center, Lebanon, NH

**Title:** Doxycycline versus standard of care oral antimicrobials for the treatment of uncomplicated urinary-tract infections in hospitalized patients

**Objectives:** In hospitalized patients with uncomplicated urinary tract infections (UTIs), inappropriate prescribing of antibiotics occurs 77 percent of the time. The first- and second-line antibiotics for uncomplicated UTIs are associated with many adverse effects, such as Clostridioides difficile infections, nephrotoxicity, or neurotoxicity. Doxycycline is not associated with these adverse effects and can be used as an alternative treatment. The purpose of this research is to assess antibiotic prescribing practice at Dartmouth-Hitchcock Medical Center and to evaluate the effectiveness of doxycycline versus standard of care oral antibiotics for the treatment of uncomplicated urinary-tract infections in hospitalized patients.

**Methods:** This will be a retrospective chart review of patient medical records obtained from the electronic health record at this institution, which will occur in two phases. All patients presenting to Dartmouth-Hitchcock Medical Center with an uncomplicated UTI treated with standard of care oral antibiotics between October 1, 2020 and September 30, 2021 and those treated with doxycycline for an uncomplicated UTI between October 1, 2017 and September 30, 2021 will be included in this chart review. The former data will be used to assess the appropriateness of antibiotic prescribing in uncomplicated UTIs as a medication use evaluation. Efficacy data from this first cohort will then be compared to patients with an uncomplicated UTI treated with doxycycline in the second phase of this project.

**Results:** Through the retrospective chart review, there will be an assessment of antibiotic prescribing for uncomplicated UTIs in hospitalized patients at this institution. Results will be reported later.

**Conclusions:** Antibiotic prescribing for urinary tract infections is not always done appropriately, with inappropriate prescribing primarily occurring in patients not showing clinical signs and symptoms warranted for a UTI diagnosis. Through this retrospective chart review, we will assess the antibiotic prescribing practices indicated for the treatment of uncomplicated UTIs in hospitalized patients at this institution. Through this assessment, we will be focusing on the appropriateness of the antibiotic prescribing, then compare efficacy with the use of doxycycline and standard of care oral antibiotics.
Effects of rapid initiation of antiretroviral therapy in an urban clinic setting

Since 2012, the NIH has recommended that all people living with HIV (PLWH) be initiated on antiretroviral therapy (ART) regardless of CD4 count. More recent data have demonstrated that even more urgent initiation of ART (termed rapid initiation), i.e. on the day of or within 72 hours of diagnosis, results in higher rates of viral suppression, medication adherence, and retention of care, as compared to deferring initiation until all relevant labs have resulted. There is a need, however, for more real-world experience with rapid initiation programs, particularly among clinics in resource-limited settings that serve a complex and largely uninsured or underinsured population, such as our HIV clinic. In 2017, our clinic adopted the New York State Department of Health protocol for rapid initiation of ART in select PLWH. We aimed to assess the advantages and disadvantages of rapid initiation of ART in our clinic population.

Methods: This was a single-center retrospective chart review of patient visits to our HIV clinic between January 2015 and June 2021. Patients were included if they were at least 18 years of age, sought care at STAR, and were newly diagnosed with HIV or re-initiated into care after at least 3 months off of ART. Included patients were stratified based on standard initiation or rapid initiation status. Rapid initiation was defined as ART initiation within 72 hours of diagnosis or clinic re-intake. Patients were excluded if they had a baseline viral load of less than 20 copies/mL (i.e. elite controllers, long-term non-progressors) or were perinatally infected with HIV. Data collected included demographics, weight and renal function, risk factors for HIV, time to ART initiation, ART regimens, baseline and follow-up viral load and CD4 counts, and other HIV-related labs.

Results: Our primary outcome is the proportion of patients with virologic suppression at 52 weeks; secondary outcomes include retention of care at 52 weeks, time from HIV diagnosis to initiation of ART, and time to viral suppression. We anticipate at least an equal proportion of patients with virologic suppression at 52 weeks in each group, as well as greater retention of care, shorter time from diagnosis to initiation of ART, and shorter time to viral suppression in the rapid initiation group.

Conclusions: The results of this study will help determine the success of the uptake of rapid initiation in our clinic. We anticipate this study reaffirming the benefits of rapid initiation of ART in
PLWH that have been identified in previous studies, and paving the way for the development of a formal protocol for rapid initiation of ART at our clinic.
Conference Abstracts
May 16-18, 2022

Presenter Name: Mock, Cynthia
Organization: VA Maryland Healthcare System
Category: Infectious Diseases
Day | Session | Room | Time: Tuesday | 3 | Magnolia B | 2:00:00 PM

Authors: C. Mock, R. DavÄ©, K. Perez, K. VonNordeck

Title: Evaluation of the safety and efficacy of antimicrobial prophylaxis in orthopedic procedures in a veteran population

Objectives: The VA Maryland Health Care System (VAMHCS) performs total hip and knee arthroplasty (THA, TKA) for Veterans to treat degenerative joint disease. Prosthetic joint infection (PJI) can occur in the joint space following THA and TKA. Traditionally, antimicrobial prophylaxis is administered perioperatively and discontinued within 24 hours; however, some providers may extend the duration based on patient specific factors. The purpose of this project is to characterize the prescribing practices of antimicrobial prophylaxis after THA and TKA and to describe the incidence of postoperative outcomes including PJI and adverse reactions associated with antimicrobial prophylaxis.

Methods: This project was a retrospective chart review of the VAMHCS electronic medical record. The timeframe of interest was January 1, 2018 through March 31, 2021. The following patients were included: Veterans admitted to the orthopedic surgical service who had a THA or TKA and received antimicrobial prophylaxis post-orthopedic procedure. Veterans were excluded if they received antibiotics within 24 hours prior to surgery. The primary outcome was to identify the characteristics of patients receiving extended antimicrobial prophylaxis (>24 hours). The secondary outcome was to describe the incidence of patients diagnosed with PJI within 90 days postoperatively and adverse events associated with antimicrobial prophylaxis. The statistical analysis was descriptive to summarize the data.

Results: A total of 150 patients who received antimicrobial prophylaxis following THA and TKA were included in the study. 124 patients (82%) received post-surgical antibiotics for <24 hours and 26 patients (17%) received an extended course of antimicrobial prophylaxis. Patients who received extended antimicrobial prophylaxis had at least one risk factor for developing PJI including 25 patients (96%) had a BMI >35 kg/m2, 7 patients (26%) had diabetes mellitus and 5 patients (19%) had an eGFR <60 ml/min. The incidence of postoperative complications included 1 patient (4%) was diagnosed with PJI and 3 patients (11%) required revision surgery within 90 days. No patients developed Clostridium difficile infection, and only 1 patient (4%) had a hypersensitivity reaction and/or acute kidney injury.

Conclusions: Antimicrobial prophylaxis was administered for <24 hours in most patients undergoing THA and TKA procedure. Patients who received extended antimicrobial prophylaxis
had risk factors for PJI. The overall incidence of PJI and revision surgery was low (4%). These findings may be helpful in standardizing prescribing practices of antimicrobials post-orthopedic surgery and to support antimicrobial stewardship efforts aiming to reduce hypersensitivity reactions and acute kidney injury associated with extended antimicrobial exposures at the VAMHCS.
Review of antibiotic use for urinary tract infections in patients discharged from the emergency department

Objectives: Inappropriate or unnecessary prescribing of antimicrobials is one of the most significant modifiable risk factors attributed to the development of antimicrobial resistance. Various articles have identified pharmacist involvement and antimicrobial stewardship interventions that lead to optimized treatment and management of urinary tract infections (UTIs) in patients discharged from the emergency department (ED). In order to address potential inappropriate prescribing of antimicrobials in the ED of a community-based teaching hospital, an institution-specific ED UTI treatment algorithm was created, derived in part from the IDSA uncomplicated cystitis and pyelonephritis UTI guidelines, and a UTI order panel was implemented in the electronic health record (EHR). The primary objective of this study was to determine the frequency of prescribing algorithm-recommended antibiotics for UTI treatment in patients discharged from the ED following implementation of the order panel.

Methods: Patients were identified from ICD-10 UTI diagnosis codes associated with ED encounters over a period of 6 months following order panel implementation in March 2021. Additional data was collected via retrospective review of the EHR. Patients were excluded if discharged to another hospital or without a prescription for antibiotics, ED stay > 24 hours, co-infected, or if previously diagnosed with UTI and treatment was continued while in the ED. Treatment of UTIs were evaluated for drug selection, dosing, and duration in accordance with the treatment algorithm, prescriptions for antibiotics in patients with asymptomatic bacteriuria (ASB), the impact of drug allergies on antibiotic selection, infection-related return visits to an LHMC clinic or ED, as well as utilization of the UTI order panel.

Results: A total of 211 patients were assessed for eligibility, and 142 patients were included. There was a total of 90 positive urine cultures, with the most commonly reported pathogen Escherichia coli (54.4%), followed by Klebsiella species (8.9%), and other enteric Gram-negative rods (8.9%). UTI was categorized as cystitis in 70 patients (49.3%), complicated infection in 23 patients (16.2%), and ASB in 49 patients (34.5%). The most commonly prescribed antibiotic was cefpodoxime (53.5%), followed by nitrofurantoin (21.1%), and sulfamethoxazole-trimethoprim (13.4%). Quinolones were prescribed in 12 patients (8.5%). Additional results will be reported.
**Conclusions:** It is anticipated that this study will demonstrate the need and role for antimicrobial stewardship interventions within the ED, and may be used to further guide educational efforts surrounding appropriate utilization of antimicrobials for UTIs.
Presenter Name: Musngi, Clynton  
Organization: MedStar Union Memorial Hospital, MedStar Good Samaritan Hospital  
Category: Infectious Diseases  
Day | Session | Room | Time: Tuesday | 3 | Magnolia B | 12:15:00 PM  

Authors: C. Musngi, K. McCann, S Turk  

Title: Comparison of vancomycin-induced nephrotoxicity prior to and post area under the curve dosing strategy implementation  

Objectives: The purpose of this study is to analyze and compare the rate of acute kidney injury in patients receiving vancomycin prior to and post-implementation of AUC dosing, as MedStar Health has recently transitioned to AUC-based dosing utilizing the Bayesian Model and InsightRx software with a goal AUC of 400-600 mg x L/hr. Over the years, studies have proved that utilizing a trough-based dosing approach with a goal of 15-20 mg/dL has been associated with an increased risk of an acute kidney injury (AKI). Additionally, recent pharmacokinetic data suggest that more than half of the patients can meet this AUC target with trough concentrations of < 15 mg/dL.  

Methods: Retrospective chart review of patients who were ≥18 years of age and received vancomycin for at least 48 hours admitted to MedStar Union Memorial Hospital and Medstar Good Samaritan Hospital. Data was collected for pre AUC implementation (February through April 2021 and post AUC implementation (July through September 2021). Patients excluded were those who had end-stage renal disease/hemodialysis and peritoneal dialysis patients, an AKI not due to vancomycin and patients who receive vancomycin for surgical prophylaxis.  

Results: Hypothesized results: Reduced rates of AKI in patients receiving vancomycin utilizing AUC dosing strategy. Patients received a lower daily dose when utilizing the AUC-based dosing compared to trough-based dosing. Results will be presented  

Conclusions: Hypothesized conclusion: In conclusion, AUC-based dosing utilizing the Bayesian Model and InsightRx software was associated with a significantly reduced rate of nephrotoxicity compared to that associated with trough-based dosing. Limitations include that this is a retrospective chart review, and therefore may introduce bias due to missing information. This study was also limited to 2 community hospitals that has a patient population that consists of more patients with an age ≥50 limiting generalizability.
Conference Abstracts  
May 16-18, 2022

Presenter Name: Nguyen, Jacqueline  
Organization: Main Line Health-Paoli Hospital  
Category: Infectious Diseases  
Day | Session | Room | Time: Wednesday | 6 | Empire C | 4:15:00 PM

Authors: Jacqueline Nguyen, Pharm D. Paoli Hospital PGY1 Pharmacy Resident; Deena Rojek, Pharm D.; Kiyo Yoda, Pharm D.

Title: Implementation of extended infusion piperacillin-tazobactam at Paoli Hospital (pilot study)

Objectives: Current guidelines from the Infectious Diseases Society of America recommend extended infusion beta-lactam antibiotics for multidrug-resistant organisms. Beta-lactam antibiotics display time-dependent efficacy when free drug concentrations stay above the minimum inhibitory concentration (MIC) for a prolonged duration of time. Data suggests that extended infusion times will yield a higher probability of antibiotic concentration to stay above the MIC and therefore increase the probability of pharmacodynamic target attainment. Overall, this can reduce mortality and length of stay. The purpose of this quality improvement project was to implement extended infusion times for piperacillin-tazobactam at Paoli Hospital.

Methods: A literature review was conducted to provide data to support the implementation of extended infusion piperacillin-tazobactam. Dosing strategies, concentrations, intravenous compatibility, stability, and smart pump programming were presented to the Pharmacy and Therapeutics committee for approval. Implementation began April 1, 2022-May 31, 2022. Patients included are any patient greater than 18 years of age in the intensive care unit (ICU) that received at least one dose of piperacillin-tazobactam. Piperacillin-tazobactam extended infusion was restricted to infectious diseases, pulmonary/ critical care, and trauma at Main Line Health. Post implementation, a retrospective chart review will be performed to evaluate smart pump programming (infusion rates, volumes, and durations). Patient outcomes will be reviewed and will include hospital length of stay, ICU length of stay, readmission within 30 days, 30-day mortality and all-cause mortality during admission. Hospital length of stay, ICU length of stay and 30-day readmission will be compared retrospectively to previous patients who have received traditional piperacillin-tazobactam infusion from October 1, 2021-November 30, 2021.

Results: In progress

Conclusions: In progress
Evaluation of unnecessary antimicrobial use in kidney transplant patients with asymptomatic bacteriuria

Objectives: Urinary tract infection is a common complication in kidney transplant recipients (KTR), notably within the first months after KT. Kidney transplant recipients are often treated for asymptomatic bacteriuria based on clinical judgment and limited data showing clear clinical benefit which could potentially increase antimicrobial resistance and unnecessary antibiotic exposure. The primary endpoint was the incidence of KTR receiving antimicrobial therapy for asymptomatic bacteriuria. This study also evaluated the incidence of pyelonephritis and cystitis, development of resistant organisms, and readmissions secondary to infection with Clostridioides difficile.

Methods: This retrospective review included patients who were admitted to Einstein Medical Center Philadelphia (EMCP) for bacteriuria, who underwent kidney transplantation between January 1, 2017 to May 1, 2021. Patients were excluded if they were less than 18 years old, pregnant, within one month of transplant, within seven days of a urologic procedure, or symptomatic (defined as evidence of pyelonephritis per clinical notes and/or radiographic imaging; temperature ≥38°C; reported symptoms). Of the identified patients, analysis was separated into two groups, patients who received antimicrobial treatment versus patients who received no treatment. Inferential statistics were used to summarize outcomes by Fisher's exact test and Student's t test.

Results: There were a total of 59 patients with 270 urine cultures evaluated. Upon review of the patients, 27 (45.8%) received antimicrobial treatment in the setting of asymptomatic bacteriuria. Baseline lab results for patients treated versus untreated with antibiotics were as follows: average age 53.9 Â± 13.5 vs 53.8 Â± 11.3 years, SCr at start of antibiotics 1.95 Â± 2.0 vs 1.28 Â± 0.5 mg/dL, WBC at start of antibiotics 6.6 x 109 Â± 3.9 x 109 cells per liter vs 7.2 x 109 Â± 5.7 x 109 cells per liter, and average time from transplant to culture 1.9 Â± 1.0 vs 1.7 Â± 0.7 months. The total duration of antimicrobial therapy was 4.25 Â± 3.44 days. Patients with polymicrobial urine cultures were more likely to have received antimicrobial therapy (61.5% vs 33.3%; p=0.0384). There were more readmissions with a resistant organism in patients that were treated with antibiotics (34.6% vs 6.1%; p=0.0077). There were no differences in
readmissions for pyelonephritis (7.7% vs 9.1%; p=1.000) or cases of C. difficile infections (0% vs 0%).

**Conclusions:** This analysis showed that 44.1% of KTR were treated for asymptomatic bacteriuria at EMCP. Treatment of asymptomatic bacteriuria was associated with an increased risk of readmission with a resistant organism. Effective antibiotic stewardship practices may help reduce resistance rates while maintaining patient safety.
Prospective audit and feedback of antibiotic use for early onset sepsis in neonates

Early onset sepsis (EOS) is a systemic infection in infants that requires antibiotic intervention due to the risks of morbidity and mortality, and existing data suggests that there are significant consequences of excessive antibiotic use on childhood development. While symptomatic cases warrant treatment, overuse of antibiotics in asymptomatic cases can be mitigated with the implementation of antibiotic stewardship practices. The objective of this IRB-approved, pre-and-post interventional study was to determine if prospective audit and feedback can improve appropriate EOS antibiotic use based on a multidisciplinary standard of care algorithm in comparison to pre-implementation of the process.

Methods: Patients were included in the study if their gestational age was greater than 37 weeks, were admitted to the Cooperman Barnabas Medical Center NICU upon birth, were born to a mother with suspected or defined chorioamnionitis, and were prescribed the following antibiotics: ampicillin, gentamicin, or cefazidime. Control data was collected via retrospective chart review of patients who met inclusion criteria who were admitted from November 2020 to April 2021 and the prospective group data was collected from November 2021 to April 2022 after implementation of a pharmacist-led prospective audit process regarding EOS antibiotic use. The primary outcome of this study was percent antibiotic appropriateness based on antibiotic choice, de-escalation, and discontinuation; secondary outcomes included antibiotic duration in hours, reported use of first line antibiotics vs. second line antibiotics, use of other antibiotics for EOS management, antibiotics restarted within 48 hours of discharge, and 30-day neonatal mortality.

Results: The baseline characteristics and results of the study outcomes will be presented.

Conclusions: It is anticipated that this project will demonstrate a role for prospective audit and feedback in improving appropriate EOS antibiotic use in the NICU setting.
Comparative efficacy of tocilizumab and baricitinib in treatment of severe COVID-19 infections.

Objectives: Since its emergence in late 2019, the corona virus disease 2019 (COVID-19) continues to pose a risk worldwide. As COVID-19 continues to spread, various pharmacologic therapies have been established for the therapeutic management of this ongoing global health crisis. Although biological agents, tocilizumab and baricitinib, have been shown to improve outcomes of patients with COVID-19, there is limited comparative evaluation between the two agents. The objective of this study was to evaluate patient demographics and efficacy of tocilizumab versus baricitinib for the treatment of severe COVID-19.

Methods: A retrospective, observational chart review was conducted and included patients who were treated with tocilizumab for severe COVID-19 infections and they were matched with patients who received baricitinib based on age and severity of hypoxemia. Patients were included if they were greater than or equal to 18 years of age requiring supplemental oxygenation while receiving at least one dose of tocilizumab or baricitinib with dexamethasone. Patients were excluded if they were on this therapy for non-COVID-19 related indications. The primary outcome of the study was to evaluate all-cause inpatient mortality in both treatment groups. Secondary endpoints included progression to hypoxemia, progression to IMV, adverse events, duration of therapy and clinical improvement between two treatment groups. Subgroup analysis was performed to evaluate any patient demographics correlation with all-cause mortality using multi-logistic regression analysis.

Results: Results of studied endpoints will be recorded and presented at conference for tocilizumab versus baricitinib.

Conclusions: It is anticipated that this project will demonstrate the comparative efficacy of tocilizumab vs baricitinib in the treatment of severe COVID-19.
Title: Frequency of therapeutic drug monitoring and occurrence of acute kidney injury (AKI) for patients receiving vancomycin on an outpatient parenteral antibiotic therapy (OPAT) program

Objectives: The primary objective of this study is to define the occurrence of AKI in patients receiving vancomycin with OPAT in once weekly versus twice weekly laboratory monitoring groups. Secondary objectives include identifying patient and antimicrobial factors that may necessitate the need for more frequent laboratory monitoring, determining frequency of therapeutic vancomycin levels, and defining the occurrence of AKI in various outpatient settings.

Methods: This study is a retrospective matched case-control review of adult patients that received at least two weeks of vancomycin with OPAT between January 2018 and December 2021 at West Virginia University Hospitals. Patients from once weekly and twice weekly laboratory monitoring groups were matched based on predisposing factors for AKI (e.g., age, body mass index (BMI), baseline creatinine clearance (CrCl), duration of vancomycin therapy, and number of concomitant nephrotoxic agents). Data collection endpoints include demographics (e.g., age, sex, BMI, CrCl, discharge location) and vancomycin characteristics (e.g., dose, frequency, duration, therapeutic drug monitoring). Both descriptive and inferential statistics will be used to analyze endpoints.

Results: Results include the rates of AKI in patients receiving vancomycin with OPAT overall and in different outpatient settings, the characterization of the patient population receiving twice weekly laboratory monitoring, and the frequency of therapeutic vancomycin attainment.

Conclusions: The results of this evaluation will be used to determine which patient and antimicrobial specific factors may warrant more frequent laboratory monitoring to minimize the occurrence of AKI in patients receiving vancomycin with OPAT.
**Title:** Improving and tracking pharmacists managed vancomycin AUC dosing at an academic medical center

**Objectives:** A recent institutional evaluation of pharmacist managed vancomycin dosing revealed the appropriateness of dosing and level monitoring to be 74.4% and 84.6% respectively. This is below our pre-defined acceptable limit of 85%. The aim of this quality improvement (QI) project is to improve the percent of adults on therapeutic vancomycin who receive appropriate doses per vancomycin treatment day from 75% to above 90% by May 2022.

**Methods:** The Institute for Healthcare Improvement (IHI) model is being utilized to conduct this QI project. Five random patients meeting the following criteria were assessed each week: > 18 years of age with a vancomycin pharmacy protocol order. The projects outcome metric is the percent appropriateness of vancomycin management per treatment day, defined as following institution guidelines and is a composite of: initial and maintenance dosing, monitoring, and indication. Process metrics include individual components of the outcome metric and additionally: days of vancomycin therapy per 1000 patient days, time to critical alerts, and time to vancomycin-related errors reported. Analysis of all metrics was completed using run charts, G-charts, and P-charts as appropriate. Implemented interventions include mandatory pharmacist education with multiple choice assessment, one-on-one remediation sessions with infectious diseases pharmacists, changing overnight new vancomycin protocols to one-time doses, updating the institution vancomycin protocol for max empiric maintenance doses to 1500 mg/dose, and limit overnight level draws and follow-up to clinical on-call.

**Results:** Between October 2021 and March 2022, 319 vancomycin treatment days have been assessed. The composite outcome of appropriate vancomycin dosing has increased from a median of 80.4% to 92.9% and has been sustained at 92.9%. Individual appropriateness of initial dosing, maintenance dosing, monitoring, indication, and overnight dosing are at a median of 100% (N=104), 100% (N=191), 100% (N=295), 100% (N=295), and 80% (N=35) respectively. The number of vancomycin critical alerts is down trending while the time between these alerts is up trending, but with no significant shift in the median.
**Conclusions:** Implementation of continuing education with assessment, work flow adjustment, and protocol updates improved appropriateness of pharmacist vancomycin dosing and monitoring at our institution. Future interventions will focus on sustainability of this initiative.
Implementation of a pharmacist-driven antibiotic time out program and its effect on antibiotic prescribing in patients admitted with suspected community acquired pneumonia and urinary tract infection

**Authors:** Marrium Qureshi, Gillian Kuszewski, Jeff Aeschlimann, Kaitlyn Elliott, Leah Leszcynski

**Title:** Implementation of a pharmacist-driven antibiotic time out program and its effect on antibiotic prescribing in patients admitted with suspected community acquired pneumonia and urinary tract infection

**Objectives:** Data from the Centers for Disease Control and Prevention (CDC) indicates that over half of antibiotic prescribing in hospitals may be inappropriate. Inappropriate antibiotic duration promotes antibiotic resistance, increases risks for adverse events, and increases drug expenditures. Antibiotic time-outs (ATO) are a CDC-recommended stewardship intervention designed to stop unneeded antibiotic therapy and ensure appropriate duration of therapy. The purpose of this study is to develop and implement a hospital-wide pharmacist-driven ATO program and to evaluate its impact on duration of antibiotic therapy for patients admitted for inpatient care of community acquired pneumonia (CAP) or urinary tract infection (UTI).

**Methods:** This IRB-approved quality improvement project consists of: (1) a retrospective chart review of patients admitted for suspected CAP or UTI from May 2021-August 2021, prior to implementation of the ATO; (2) a pharmacist educational program describing ATOs and the processes for conducting them (i.e., screening potential time-out patients, applying guidelines for recommendation of discontinuing therapy or continuing for an appropriate duration, communication with prescribers, and ATO documentation); and, (3) collection of data post-ATO implementation from December 2021-March 2022. Patients in the pre-ATO group were identified through an electronic medical record report based on receipt of common empiric antibiotics for suspected CAP and UTI including the following: cefepime and azithromycin, cefepime and doxycycline, ceftriaxone and azithromycin, ceftriaxone and doxycycline, levofloxacin, cefepime, ceftriaxone, and piperacillin-tazobactam. The post-ATO group includes patients 18 years and older with ATO documentation and started on similar antibiotics. Patients who receive an Infectious Disease team consultation as part of care are excluded from both the pre- and post-ATO groups.

**Results:** The primary outcome measure is the difference in total duration of antibiotic therapy between pre- and post-ATO groups. Secondary outcomes include proportion of patients with discontinuation or de-escalation of broad-spectrum therapy, 30-day readmission, length of stay,
number of pharmacist ATOs documented, and proportion of pharmacist ATO interventions accepted.

**Conclusions:** It is anticipated that this project will demonstrate the role for pharmacist driven antibiotic time outs and pharmacist intervention in improving appropriateness of antibiotic duration in patients admitted for UTI and CAP.
Use of Anticoagulants and Antiplatelet Agents in Living Donor Liver Transplant (LDLT) Recipients

Objective: LDLT was first attempted in the 1980s in children to shorten the waiting period for a liver transplant (LT). According to the Organ Procurement and Transplantation Network (OPTN), 569 LDLTs were performed in 2021. Despite the advancements in LT, there remain a significant number of complications. One of the most significant complications is vascular thrombosis of the reconstructed hepatic artery and portal vein, which potentially results in hepatic failure and graft loss. In addition to thrombotic risks, LT is associated with a high bleeding risk, as it is performed in a setting of already unstable hemostasis. For this reason, routine perioperative prophylactic anticoagulation is usually not the standard of care. The purpose of this study is to evaluate the use of anticoagulants and antiplatelet agents in living donor liver transplant recipients and to assess safety and efficacy outcomes associated with these therapies.

Methods: Our study is a single center retrospective study of all adult and pediatric patients who received a living donor liver graft between July 1, 2016 to December 31, 2020. Patients were excluded from the study if any of the following criteria were met: received a deceased donor graft, recipients with a history of concomitant hypercoagulability disorders such as antiphospholipid syndrome, Factor V Leiden, hyperhomocysteinemia, active malignancies, hormone replacement, contraceptives (estrogen), and COVID-19 infection. Data was collected on recipient demographics, anticoagulant and antiplatelet regimens, pertinent clinical labs values and recipient outcomes. Study endpoints that were described include, anticoagulant/antiplatelet therapy, reversal agent use, thrombotic and bleeding events, graft loss and one-year patient survival.

Results: During the study period, 55 LDLT recipients were transplanted and 41 patients met inclusion criteria. Of those included, 11 (27%) experienced a hepatic thrombotic event (HTE), 34 (83%) received at least one anticoagulant post-transplant and 38 (93%) received an antiplatelet agent post-transplant. HTE occurred in 29% (n=10) of patients on an anticoagulant vs 14% (n=1) of patients who were not on an anticoagulant (p=0.651). Anticoagulant use did not reduce
the incidence of HTE. Antiplatelet use resulted in fewer HTE [26% (n=10) vs 33% (n=1)] compared to patients who were not on an antiplatelet regimen. Overall, 91% of patients in the HTE group received at least one anticoagulant or antiplatelet agent. In the thrombosis-free group, 80% received an anticoagulant and 93% an antiplatelet agent. No patients experienced graft loss. One death occurred in the thrombosis-free group unrelated to LT complications. Use of vitamin K for reversal occurred in 27% of patients in the HTE group vs 3% in the thrombosis-free group (p=0.052). A hemorrhagic event was identified in 27% of patients with HTE vs 30% of patients in the thrombosis-free group during the 1-year post-transplant period (p=1).

**Conclusions:** Hepatic thrombosis had a lower incidence in patients who were receiving an antiplatelet regimen; however, this was not a statistically significant finding. Anticoagulant use post-transplant did not decrease the incidence of hepatic thrombosis. Graft loss and one-year patient survival did not significantly differ between the two groups.
Efficacy of extended-infusion piperacillin/tazobactam compared to traditional-infusion in cystic fibrosis pulmonary exacerbations

Authors: Zach Rebollido; Cory Hale; Meghin Haines; Kyle Sukanick

Title: Efficacy of extended-infusion piperacillin/tazobactam compared to traditional-infusion in cystic fibrosis pulmonary exacerbations

Objectives: Patients with cystic fibrosis (CF) are prone to recurrent pulmonary exacerbations often associated with difficult-to-treat pathogens with higher minimum inhibitory concentrations (MICs), such as Pseudomonas aeruginosa. An additional factor complicating treatment is the relatively low penetration of antibiotics into lung secretions, and although guidelines advise on antibiotic selection, optimal dosing is not stated. The purpose of this study was to compare outcomes before and after a transition to extended-infusion piperacillin/tazobactam (PT) given over 4 hours every 8 hours.

Methods: This was a retrospective chart review of patients admitted for CF pulmonary exacerbations from 3/2013 to 7/2021. Patients were grouped based on PT infusion method (pre-implementation/traditional-infusion and post-implementation/EI), and assessed based on the primary outcome of pulmonary exacerbation-related hospitalization within 90 days after discharge. Secondary outcomes included length of stay and total duration of antibiotics. Inclusion criteria consisted of patients greater than or equal to 18 years of age, diagnosis of CF (based on diagnosis code E84), and receipt of PT during an inpatient encounter at PSHMC. Patients were excluded if PT was used for an indication other than CF exacerbation, had a creatinine clearance less than 20 mL/min, received <72 hours of PT, and if sputum cultures were not collected.

Results: 119 patients were included with 85 patients in the pre-implementation group and 34 patients in the post-implementation group. CF exacerbation-related re-hospitalization occurred in 61.9% in the pre- vs 60.0% post-implementation arms. The time until next exacerbation occurred at a mean of 36.2 days vs 49.3 days, respectively.

Conclusions: A transition from traditional infusion PT to extended infusion PT given every 8 hours resulted in similar re-hospitalization rates, but a prolonged time to next exacerbation. Additional studies are needed to confirm this potential benefit, particularly with higher daily doses of extended infusion PT (i.e. every 6 hour dosing).
Baricitinib versus tocilizumab for the treatment of moderate to severe COVID-19

Objectives: As of December 2021, Coronavirus disease 2019 (COVID-19) has led to 5.3 million deaths worldwide. Despite treatment advances, reducing mortality among hospitalized patients remains a crucial unmet need. The National Institutes of Health (NIH) guidelines recommend adding a second immunomodulatory agent, tocilizumab (TCZ) or baricitinib (BARI), to dexamethasone in patients with rapidly increasing oxygen requirements and systemic inflammation. As of February 2022, the NIH guidelines do not recommend one agent over the other. This study will compare the rates of progression to mechanical ventilation and in-hospital mortality for TCZ versus BARI in patients with moderate to severe COVID-19.

Methods: This single-center, retrospective cohort study was conducted on patients admitted to Winchester Medical Center between August 2021 and December 2021. Patients aged 18 years or older who received at least one dose of TCZ or three doses of BARI were included. Patients were excluded if they were pregnant, mechanically intubated before first dose of either TCZ or BARI, received both therapies, or remained hospitalized at time of data collection. The primary endpoint is a composite outcome of progression to mechanical ventilation or in-hospital mortality. Secondary endpoints include components of the composite outcome and progression to higher level of care, duration of mechanical ventilation, hospital length of stay (LOS), and intensive care unit (ICU) LOS. Safety endpoints include incidence of hospital acquired infection and thrombosis.

Results: A total of 176 patients were included, of which 61 (34.7%) received TCZ and 115 (65.3%) received BARI. The primary outcome was not statistically significant between groups (52.5% TCZ vs. 44.3% BARI, p = 0.305). There were no statistically significant differences noted between groups in regards to progression to mechanical ventilation (36.1% TCZ vs. 28.7% BARI, p = 0.315), in-hospital mortality (50.8% TCZ vs. 41.7% BARI, p = 0.249), progression to higher level of care (18% TCZ vs. 17.4% BARI, p = 0.926), duration of mechanical ventilation (median 9 days TCZ vs. 6 days BARI, p = 0.311), hospital LOS (median 8 days TCZ vs. 14 days BARI, p = 0.193), and ICU LOS (median 7 days TCZ vs. 8 days BARI, p = 0.964). For safety outcomes, there was no difference in rate of hospital acquired infection (36.1% TCZ vs. 26.1% BARI, p = 0.167), but rate of thrombosis was higher in the TCZ group (11.5% TCZ vs. 3.5% BARI, p = 0.042).
Conclusions: There was no significant difference in the composite outcome of progression to mechanical ventilation or in hospital mortality in patients who received TCZ or BARI for the treatment of COVID-19. However, this primary outcome occurred more frequently in the TCZ group and a larger study may be able to detect this difference. Therefore, larger studies comparing these two agents are warranted.
Title: Prevention of early recurrent atrial fibrillation using amiodarone after successful direct current cardioversion

Objectives: Direct current cardioversion (DCCV) is highly effective in restoring normal sinus rhythm in patients with atrial fibrillation (AF), but rates of recurrence may reach 57% within one month and increase to 83% within a year. Amiodarone has been shown to decrease rates of recurrent arrhythmia more effectively than other antiarrhythmics when initiated 30 days prior to DCCV. Amiodarone also has prolonged half-life that requires several weeks of therapy or loading doses to reach steady state. Additionally, incidence of side effects is common as length of therapy increases, requiring regular monitoring. This retrospective analysis aimed to expand on existing literature examining the efficacy and safety of acute initiation of amiodarone immediately prior to or after DCCV, testing the hypothesis that patients initiated on amiodarone have lower rates of recurrent arrhythmia in the first three months after DCCV.

Methods: The primary end point was recurrence of AF within 3 months of cardioversion as noted on follow up encounters. Secondary end points included relevant safety data. This study excluded patients for whom follow up data was unavailable and who received antiarrhythmic therapy other than or in addition to amiodarone initiated within one month prior of DCCV.

Results: Ninety-five patients were included in the study at our institution from 9/24/2020 – 4/6/2021. Most baseline characteristics were not statistically different between groups. However, the treatment group had significantly more patients with persistent AF (47.8% vs 28.6%), higher baseline rates of heart failure (67.4% vs 26.5%) and higher mean baseline QTc values (470 ± 43 vs 451 ± 36 msec). Treatment with amiodarone significantly decreased the risk of recurrent arrhythmia within three months of DCCV (OR 0.23, 95% CI 0.096-0.543). Logistic regression analysis showed that heart failure status and persistent AF did not predict recurrence of AF. Amiodarone therapy did not increase risk of overall adverse events, hospitalization, new bradycardia, increase in QTc, new thyroid or liver dysfunction, or new AV block. One patient had new documented intolerance to amiodarone.

Conclusions: Our data suggests the use of amiodarone may be a safe and efficacious option to decrease rates of recurrent arrhythmia after successful cardioversion when started acutely prior to or immediately after DCCV. This data is limited by the fact that after 3 months of therapy
on amiodarone, patients are not yet indicated for therapy monitoring like repeat liver and thyroid panels. Therefore, our safety endpoints are limited to patients who became symptomatic or presented with concerns for an adverse event leading to testing earlier than what is recommended.
Evaluation of Multiplex PCR expenditure on timeliness to appropriate antibiotics with cost effectiveness analysis

Objectives: Antimicrobial resistance is an ongoing problem plaguing health care systems due to overuse of antibiotics. Multiplex polymerase chain reaction (PCR) technology provides a mechanism to more quickly identify common pathogens as well as the potential for certain antimicrobial resistance genes. Use of this technology could allow for faster identification of pathogens present in infections and provide a way to select the most appropriate antibiotic in a timelier fashion. The objective of this study is to compare the time to appropriate antibiotics in bacteremic patients before and after implementation of multiplex PCR technology.

Methods: This is a single-center, pre-post intervention study occurring at Conemaugh Memorial Medical Center. The intervention is utilization of multiplex PCR on the first positive blood culture for each patient compared to conventional culture and sensitivity alone. Data including patient demographics, antibiotic use, culture results, length of stay, and in-hospital mortality were extracted from the medical records. Investigators were blinded as to intervention group. Appropriate antibiotic use is determined by local susceptibility patterns and empiric recommendations for common infections.

Results: The time to appropriate therapy, length of stay, in-hospital mortality, and total cost of care for the pre- and post-intervention groups will be presented.

Conclusions: It is anticipated that this project will demonstrate a decreased time to appropriate therapy without compromising length of stay, in-hospital mortality, or total cost of care.
Author Name: Russo, Tiffany
Organization: Baystate Medical Center
Category: Infectious Diseases
Day | Session | Room | Time: Poster

Authors: T. Russo, M. Lorenzo; Baystate Medical Center, Springfield, MA

Title: Characterization and Cost of Care for Patients Receiving Dalbavancin

Objectives: Historically, treatment of serious Gram-positive infections in persons who inject drugs (PWID) has posed a challenge due to the frequent need for long-term intravenous (IV) antibiotics and concerns regarding potential misuse or inappropriate care of IV access. Utilization of dalbavancin (DAL), a long-acting lipoglycopeptide, potentially obviates these concerns. While the utility of DAL has been demonstrated in serious Gram-positive infections, hesitancy to adopt its use in healthcare systems exists due to the cost-prohibitive nature of DAL and perceived issues with insurance reimbursement. However, several articles have suggested cost savings with DAL use through projected cost and healthcare utilization data. Our study looks to determine the cost effectiveness of DAL use in actual, measured cost and healthcare utilization data.

Methods: Patients were treated with DAL as a part of routine care based on a newly developed institutional care pathway at a 700-bed academic medical center. Retrospectively, PWID treated with DAL were reviewed for information regarding demographics, characteristics of infection and care, and rate of treatment failure with DAL. Cost and health care utilization information were also assessed for PWID treated with DAL and a random sample of PWID with S. aureus bacteremia treated prior to the institutional availability of DAL. Descriptive statistics were used for patient characteristics, Student's T test was utilized to compare cost data between the DAL and non-DAL patients.

Results: From June 2020 to January 2021, 30 patients, all of whom were PWID and had substance use disorders precluding the use of usual care plans received DAL. Mean (SD) patient age was 44 (13), 25 (78%) patients were bacteremic, 25 (78%) of patients had a deep-seated source of infection, and 28 (87.5%) of infections were caused by S. aureus. The median (IQR) duration of total antibiotic therapy days was 35 (26-43) in the DAL group, and the median (IQR) duration of DAL use was 25 (14-28), with 22 (69%) completing the planned course of therapy. Additionally, DAL patients had a 0% rate of mortality, 28% rate of readmission, and 12.5% rate of treatment failure. When DAL was used, there was no statistically significant difference in the contribution margin which averaged at -$10,412 and -$11,214 for DAL and normal care respectively (P=0.85).
Conclusions: DAL use in select patients with infections requiring long term use of antibiotics may be a viable treatment option, with no statistically significant difference in contribution margins.
Multiple Recurrent Clostridioides Difficile Infections: An Evaluation of Patient Cases and Economic Impact at a Community Teaching Hospital

**Title:** Multiple Recurrent Clostridioides Difficile Infections: An Evaluation of Patient Cases and Economic Impact at a Community Teaching Hospital

**Objectives:** The purpose of this retrospective analysis is to evaluate the subset of patients with multiple rCDI related admissions and evaluate their economic impact on our community teaching hospital, AtlantiCare Regional Medical Center (ARMC).

**Methods:** Patients who tested positive for CDI between Jan 2016-Dec 2020 were identified by a generated report. Those included in this analysis had 3 or more inpatient admissions due to CDI during the study period. Subjects who tested positive for CDI but did not display clinical signs and symptoms of disease were excluded. Twenty nine patients met study inclusion criteria. Admissions for anything other than CDI were excluded. Data collected included patient demographics, LOS for each CDI episode, acuity of care, CDI severity, mortality, utilization of all antimicrobials, immune status, laboratory parameters, and days between each CDI admission. Immunocompromised state was defined as having a diagnosis of HIV/AIDS, being on chemotherapy or radiation therapy, receiving an organ transplant, using chronic steroids, having an autoimmune disorder, or being on immune suppressing medication. Patients were deemed potentially eligible for FMT on their 3rd CDI related admission if they had no history of IBD and no immunocompromising conditions. Investigators reviewed the EMR of patients and assessed for commonalities, patient disposition, and factors potentially contributing to the development of rCDI.

**Results:** Twenty nine patients accounted for 108 admissions over a period of four years. The median number of admissions per patient was three. The median length of time between admissions was 54 days and the median length of stay per admission was seven days, ranging from 1-69 days. The median age of patients studied was 57 years, ranging from 27-94. The majority of patients were female (n=21, 72.4%) and the most prevalent risk factors for rCDI development were history of GI surgery (n=13, 44.8%), BMI > 30 (n=11, 37.9%), and CKD (n=11, 37.9%). A total of 1,006 inpatient days were attributed to 29 patients with 108 CDI admissions, including 74 days in the ICU. After incorporating the total Medicare reimbursement possible for all 29 patients with 108 CDI admissions, the net loss for the hospital was approximately $2,123,000. Nineteen patients (65.5%) were identified as potential candidates for...
FMT. This study only assessed rCDI admissions, but all identified patients had two or more non-CDI admissions during the timeframe. Three of the 29 subjects died within the study period.

**Conclusions:** This evaluation has revealed the economic burden attributed to a subset of patients with rCDI who required multiple hospitalizations. The current treatment paradigm for CDI and rCDI should be examined to address recurrent disease in our patient population. These findings will implore our hospital's Antimicrobial Stewardship Team to assess all treatment initiatives that can produce a sustained, durable cure for CDI, such as FMT.
**Conference Abstracts**  
May 16-18, 2022

**Presenter Name:** Sallerson, Samantha  
**Organization:** The Unity Hospital of Rochester  
**Category:** Infectious Diseases  
**Day | Session | Room | Time:** Monday | 2 | Magnolia B | 2:45:00 PM

**Authors:** Samantha Sallerson, PharmD and Jennifer Petronis, PharmD, BCPS  
**Title:** Evaluation of MRSA surveillance on the empiric treatment of pneumonia at a community teaching hospital  

**Objectives:** In recent years, MRSA nasal surveillance has become a useful tool in ruling out MRSA pneumonia with a 95% negative predictive value (NPV). Previous studies have shown MRSA nasal surveillance has a clinical utility in de-escalating early empiric vancomycin therapy. The objective of this study is to evaluate the use of MRSA nasal swab surveillance on the empiric use of vancomycin treatment of pneumonia at Unity Hospital, a 385-bed community teaching hospital in Rochester, NY.

**Methods:** A single-center, retrospective chart review will be conducted to include patients who had an order placed for intravenous vancomycin with an indication of suspected pneumonia between October 2021 and December 2021. Patients will be further stratified based on those that obtained a MRSA swab versus those that did not obtain a MRSA swab. Excluded patients will be those with a positive culture. The primary endpoint is duration of vancomycin therapy from a negative MRSA nasal swab. Secondary outcomes will include total vancomycin duration, duration of vancomycin prior to MRSA nasal swab being obtained, percentage of vancomycin de-escalations from a negative MRSA nasal swab and duration of hospital stay.

**Results:** Duration of vancomycin treatment and utilization of MRSA nasal swabs will be recorded and presented.

**Conclusions:** It is anticipated that this project will demonstrate an opportunity to implement a pharmacist-driven protocol for MRSA nasal swab screening to decrease empiric vancomycin therapy duration.
**Conference Abstracts**
May 16-18, 2022

**Presenter Name:** Sandman, Travis  
**Organization:** MedStar Montgomery Medical Center  
**Category:** Infectious Diseases  
**Day | Session | Room | Time:** Wednesday | 5 | Magnolia B | 1:45:00 PM

**Authors:** Authors: Sandman, Travis J; Cain, Alexander R; Carroll, James D.

**Title:** Evaluating the effectiveness of pharmacist-led education for emergency department urinary tract infection prescribing

**Objectives:** To determine if pharmacist-led education provided to emergency department (ED) physicians reduces the rate of antibiotic prescribing for patients with suspected urinary tract infection (UTI) without urinary symptoms while in the ED.

**Methods:** A retrospective, pre- and post-intervention electronic medical record review was performed among patients who had an order for ceftriaxone while in the ED. The pre-intervention phase was conducted from March-April 2021. Patients were included in the study if they received a dose of ceftriaxone or azithromycin while in the ED. Patient were excluded if they received concomitant azithromycin, were less than 18 years of age, were not being treated for a UTI, had another compelling indication for antibiotics, had a UTI admission in the previous 30 days, or had a urinary catheter. The data collected during the pre-intervention phase, as well as guidance to distinguish true UTI from asymptomatic bacteriuria, was then presented to ED physicians during a monthly staff meeting in January, 2022. Following the educational session, data was collected from February-March 2022 to assess changes in prescribing trends.

**Results:** During the pre-intervention phase, a total of 60 unique patient encounters were examined. Of these 60 encounters the following demographic information was obtained: 51 female (85%), median age 75.5 years (IQR 58.5-88). A total of 33 patients (55%) who received ceftriaxone for the treatment of a UTI while in the ED had no specific urinary symptoms at the time of treatment. Data from the post-intervention phase is currently being collected and is pending analysis.

**Conclusions:** It is anticipated that this study will demonstrate a need for more intensive pharmacist-driven education and intervention to help reduce the rate of inappropriate antibiotic prescribing for patients presenting without specific urinary symptoms in the ED.
Title: Prevention of orthopedic surgical site infections with a modified antimicrobial prophylaxis guideline

Objectives: The Center for Disease Control and Prevention has defined a surgical site infection (SSI) as one which occurs within 30 days from procedure or within 90 days after a prosthetic implantation procedure. At AtlantiCare Regional Medical Center (ARMC), the antimicrobial stewardship program (ASP) ensures the appropriate use of antibiotics by utilizing a surgical prophylactic antibiotic protocol (SPAP) derived from guidelines and local susceptibility patterns. In 2021, our surveillance noted an increase in SSIs in certain orthopedic procedures utilizing cefazolin or vancomycin as prophylaxis. The ASP modified the SPAP by adding gentamicin to orthopedic procedures in July 2021. The purpose of this pre-post study is to evaluate the rate of postoperative infections before and after our SPAP modification.

Methods: A pre-post study was performed to evaluate the efficacy of cefazolin or vancomycin, with and without gentamicin, for prophylaxis in orthopedic surgeries. The primary outcome measure was the rate of postoperative infections before and after the addition of gentamicin. Included in our analysis were all hip and knee arthroplasty procedures in 2021 that received prophylactic antibiotics according to the ARMC SPAP. Reports from Cerner's Discern Analytics and Safety Surveillor were utilized to identify the type of surgery performed and any subsequent infections that developed. Data collection included the prophylactic antibiotic regimen prescribed before and after the ASP intervention, as well as postoperative infection details. January to June procedures included cefazolin or vancomycin (for penicillin allergy or MRSA detection), while July to December utilized the addition of a weight-based gentamicin dose. As a quality measure, this initiative was determined to be successful if the number of orthopedic SSIs decreased by more than 50%. The data will be compared pre and post intervention utilizing appropriate statistical analysis. This study was approved by the review board at ARMC.

Results: The total number of orthopedic surgeries analyzed in 2021 was 3981, with 2020 surgeries occurring before the intervention and 1961 afterwards. There were 11 cases of post-orthopedic SSIs identified in this study, 63.6% (n=7) were hip arthroplasty and 36.4% (n=4) were knee arthroplasty. Of all cases analyzed, 10 (90.9%) infections occurred before gentamicin...
was added to cefazolin or vancomycin for prophylaxis. Of those 10 infections, 4 were Staphylococcus aureus (1 MRSA), 1 Group B Streptococcus, 1 Pseudomonas, and 5 gram negative enterobacterales. Following the addition of gentamicin to the SPAP in July 2021, there has been 1 reported SSI from a hip arthroplasty, caused by Klebsiella. The addition of gentamicin to our SPAP has resulted in a 90% decrease in the number of orthopedic SSIs observed at ARMC. Prior to the addition of gentamicin, the risk of SSI occurrence was 0.5%. After our ASP intervention, the risk for SSI occurrence is 0.05% which was found to be statistically significant, (p=0.0076, |z|=0.05).

Conclusions: Postoperative SSIs cause a significant burden on patients and healthcare facilities. Monitoring for SSIs is necessary to ensure that prophylactic antibiotics are effective at preventing post-surgical infections. The modification of our SPAP was successful in reducing the number of SSIs for our knee and hip surgical procedures. It is crucial to monitor the rate and type of postoperative infections and if necessary, modify prophylactic antimicrobial regimens to ensure the best outcomes for our patients.
Characterization of cefepime levels in hospitalized patients with suspected neurotoxicity

Objectives: Therapeutic drug monitoring (TDM) of beta-lactams is being increasingly recommended to support the optimization of pharmacokinetic and pharmacodynamic parameters. However, TDM of cefepime is often utilized when suspicion of neurotoxicity exists. While a neurotoxic threshold of 22 mg/L has been proposed, the true toxic threshold has yet to be established. This study aims to characterize cefepime levels in patients with suspected neurotoxicity and determine the probability that cefepime produced clinical neurotoxicity.

Methods: Patients were assessed for inclusion if they had a cefepime level obtained during an inpatient hospital stay. Patients were excluded for the following reasons: (1) if the level was obtained for efficacy reasons rather than suspicion of toxicity; (2) if they received cefepime at an outside facility without any doses of cefepime documented in our electronic medical record; (3) if cefepime levels were not drawn as a trough; (4) if they were receiving renal replacement therapy; or (4) if they were pregnant. Cefepime serum trough concentrations were characterized using descriptive statistics. The causal relationship between cefepime and suspected neurotoxicity was assessed using the Naranjo Scale.

Results: A total of 158 cefepime levels were obtained in 120 patients between January 2020 and August 2021. The most common reason for exclusion was that the cefepime level was not drawn as a trough (n=67 patients, 30.8%), and only 3 (2.5%) were because the level was drawn for efficacy reasons. Overall, 27 patients with suspected neurotoxicity due to cefepime use were included for further evaluation. The median trough level was 77.1 mg/L (IQR 35.9-152.4 mg/L). Of these, only 3 (11.1%) exhibited trough levels below the proposed neurotoxic threshold of 22 mg/L. The probability that cefepime produced clinical neurotoxicity based on the Naranjo Scale was possible (score 1-4) in 25 patients (92.5%) and probable (score 5-8) in 2 patients (7.5%). Seizures were a symptom of neurotoxicity in only 2 patients (7%). The most common clinical action based on the cefepime level was the discontinuation of cefepime and initiation of a non-carbapenem alternative, which occurred in 13 patients (48.1%).

Conclusions: In this retrospective study, clinical suspicion of cefepime-induced neurotoxicity was a good predictor for serum trough concentrations above 22 mg/L. Further studies are...
needed to determine the true toxic threshold for cefepime and if a serum level is indicated versus an antibiotic change based on neurotoxic symptoms.
Determination of multidrug resistant pathogen risk factors in community acquired pneumonia patients

**Objectives:** Multidrug resistant (MDR) pathogens are a current threat to public health. Typically, these pathogens are associated with nosocomial infections. However, the prevalence of MDR pathogens occurring within community acquired infections has increased. The recognition of MDR pathogens and potential risk factors in community acquired pneumonia (CAP) patients is critical because effective treatment requires different antimicrobial therapy than non-MDR CAP. The objective of this study was to identify and validate risk factors for MDR pathogens, specifically methicillin-resistant Staphylococcus aureus (MRSA), Pseudomonas aeruginosa, and extended-spectrum beta-lactamase (ESBL) producing Enterobacteriaceae, in the setting of CAP.

**Methods:** This study was conducted via retrospective chart reviews of patients admitted to Bon Secours St. Mary's Hospital in Richmond, Virginia, from January 1, 2021 to December 20, 2021. Patients were included in the study if they had an International Classification of Diseases 10th Edition (ICD-10) diagnosis code for CAP and a respiratory culture drawn within 72 hours of admission. The primary outcome was the percentage of patients diagnosed with CAP, who grew one of the MDR pathogens (MRSA, P. aeruginosa, and ESBL-producing Enterobacteriaceae). The chi-squared test was used for categorical variables and a multivariate logistic regression analysis was utilized for the investigation of local risk factors.

**Results:** Data was collected on 139 patients, of which 16 patients met the primary outcome and were included in the study for analysis. The percentage of patients who met the primary outcome, along with baseline characteristics, clinical characteristics, and secondary outcomes will be presented.

**Conclusions:** It is anticipated that this project will demonstrate MDR pathogen risk factors to streamline appropriate and effective antimicrobial therapy for CAP patients who grow MRSA, P. aeruginosa, or ESBL-producing Enterobacteriaceae.
Authors: Shukdinas, Alaina

Title: Characteristics associated with mortality in patients with gram-negative bacteremia in intensive care units

Objectives: Bloodstream infections have an estimated overall mortality rate of 15-30%. The objective of this study is to determine common characteristics associated with mortality in patients who are ICU level of care and have gram-negative rod bacteremia.

Methods: Medical records of patients requiring ICU level of care who were admitted to the three Thomas Jefferson University hospitals between November 1, 2019 and November 30, 2021 and had gram-negative bacteremia, were 18 years of age or older, had one or more blood cultures showing growth of either a lactose-fermenting coliform (Escherichia coli, Klebsiella spp., Serratia spp., Morganella spp., Citrobacter spp., Enterobacter spp. or Proteus spp.), a non lactose-fermenting coliform (Acinetobacter spp., Salmonella spp., Stenotrophomonas maltophilia) or a Pseudomonas spp. Demographics evaluated include age, sex, comorbidities (as rated on the Charleston Comorbidity Index), empiric therapy appropriateness, organism, source, vasopressor requirement, PITT bacteremia score, and APACHE II score were reviewed. Patients who had metastatic cancer, had been hospitalized in the last 30 days, left against medical advice, had a blood culture with growth of any organism not listed above, or had a blood culture determined to be a contaminant were excluded from the evaluation.

Results: Characteristics statistically significant with mortality in gram-negative bacteremia will be recorded and results will be presented.

Conclusions: It is anticipated that this project will demonstrate characteristics of patients that are associated with mortality when patients present with gram-negative bacteremia requiring ICU level of care.
Comparison of two oritavancin formulations and their impact in the emergency department

Authors: O. Smith, C. Whittaker, E. Nhan, J. Reilly, A. Kardos

Title: Comparison of two oritavancin formulations and their impact in the emergency department

Objectives: Oritavancin is a single-dose intravenous (IV) antibiotic indicated for the treatment of acute bacterial skin and skin structure infections (ABSSSI). Two brand name formulations of oritavancin have been approved for the treatment of ABSSSI; one formulation is a three-hour infusion and the other is a one-hour infusion. The objective of this study was to examine the impact of switching between oritavancin formulations in the emergency department (ED), from the three-hour infusion to the one-hour infusion.

Methods: A report generated from Cerner Discern Analytics identified forty-eight patients admitted to the ED between September 2021 and January 2022 for oritavancin administration. These patients were included in this study and evaluated if they had an ABSSSI diagnosis, received either oritavancin formulation in the ED, and were not admitted inpatient. Data collection included the oritavancin formulation received, history of IV drug use, ED length of stay (LOS), infection type, history of skin infection, history of antibiotic use prior to receiving oritavancin, and return to the ED within 30 days for an ABSSSI. History of skin infection was defined as having an inpatient or ED visit within the past year for any ABSSSI. History of antibiotic use was defined as receiving oral or IV antibiotics within 4 weeks of ED presentation. Outcome measures will include time spent in the ED for both oritavancin formulations. The secondary endpoint will be return to the ED within 30 days for recurrent ABSSSI. Collected data will be assessed by the independent t-test or Chi-square test as appropriate. Alpha is set to 0.05. This research will be submitted to the institutional review board.

Results: Twenty-four patients who received the one-hour infusion and twenty-four patients who received the three-hour infusion were identified as meeting inclusion criteria and will be analyzed. The results of the primary and secondary endpoints will be evaluated and presented.

Conclusions: Both formulations of oritavancin have similar efficacy in treating ABSSSI. It is anticipated that our study will demonstrate that patients who received the one-hour oritavancin infusion will have a shorter ED LOS compared to those who received the three-hour infusion. This will potentially impact provider antibiotic choices and hospital protocol for ABSSSI treatment in the ED.
Defining effective treatment durations for patients with bloodstream infections caused by carbapenem-resistant Enterobacterales: A multicenter observational study

**Objectives:** More than 2.8 million antibiotic-resistant infections occur annually in the United States (U.S.) leading to mortality in excess of 35,000 and immeasurable morbidity. An important contributor to the crisis of antibiotic resistance is unnecessarily prolonged durations of antibiotic therapy. At least 3 randomized controlled trials indicate that approximately 7 days of antibiotic therapy are sufficient for the treatment of Gram-negative bloodstream infections (BSI). It is unknown if this duration needs to be extended for the treatment of BSI caused by pathogens with more drug-resistant phenotypes such as carbapenem resistance. Our objective was to determine if prolonged durations of antibiotic therapy are necessary to improve the outcomes of patients with carbapenem-resistant Enterobacterales (CRE) BSI.

**Methods:** We performed a retrospective observational study of hospitalized patients ≥ 18 years of age with CRE BSI admitted between January 1, 2019 to December 31, 2019 at any of 24 U.S. hospitals. The following information was collected on all patients: demographics, medical conditions, severity of illness, source of BSI and source control measures, microbiological data, antibiotic treatment, and clinical outcomes. Baseline data were compared using the χ2 test for categorical data. Continuous data were compared using the Wilcoxon rank sum test. The short-course group received 7-10 days of antibiotics and the prolonged-course group received at least 11 days. The primary outcome is a composite of all-cause mortality or recurrent infection, both within 30 days post-treatment. Inverse probability of treatment weighting will be performed to account for selection bias that may have impacted the duration of antibiotic treatment selected. Secondary outcomes will include treatment-associated adverse events (a composite of central-line complications, recovery of a resistant organism from a subsequent culture, C. difficile infection, or other adverse events leading to discontinuation of therapy).

**Results:** A total of 267 patients met eligibility criteria. The findings of the primary and secondary outcomes are forthcoming.

**Conclusions:** It is anticipated that this study will identify whether prolonged courses of antibiotic therapy are necessary to improve outcomes in patients hospitalized with CRE bacteremia.
**Conference Abstracts**
May 16-18, 2022

**Presenter Name:** Spangler, Jessica  
**Organization:** Hartford Healthcare  
**Category:** Infectious Diseases  
**Day | Session | Room | Time:** Monday | 1 | Magnolia B | 12:30:00 PM

**Authors:** J. Spangler, PharmD, A. Gentry PharmD, BCIDP, A. Bilinskaya, PharmD, BCIDP

**Title:** Evaluation of real-time notification and subsequent pharmacist intervention on time to targeted therapy in patients with bacteremia

**Objectives:** Bloodstream infections (BSIs) are associated with a high mortality rate and timely administration of empiric broad-spectrum antibiotics is critical. However, prolonged exposure increases the risk of colonization and subsequent infection with resistant bacteria. Identification of the causative organism via rapid diagnostics and routine prospective audit and feedback allows for decreased time to targeted therapy and potentially decreases the risk of resistance, mortality, and length of stay compared to standard culture methods.

**Methods:** The objective of this quasi-experimental study was to evaluate changes in time to targeted antibiotic therapy before and after implementation of a real-time pharmacist notification for bacteremic patients. The pre- and post-intervention periods were 9/1/19–12/31/19 and 9/1/21–12/31/21, respectively. Patients admitted for greater than 48 hours with bacteremia identified via the direct from culture rapid pathogen identification kit were included in the study. Patients were excluded if they had more than one BSI or polymicrobial BSI during hospitalization, treatment of a concurrent infection, or transitioned to hospice. The primary outcome was change in time to targeted antibiotic therapy. Secondary outcomes included change in broad-spectrum antibiotic days of therapy, total duration therapy, hospital length of stay, and in-hospital all-cause mortality.

**Results:** A total of 132 charts were reviewed, 80 of which were included, with 47 in the pre- and 33 in the post-intervention group. There was a trend towards decreased time to targeted therapy in the post-intervention group at 5.4 hours (1.4–40.1) compared to 33.0 hours (1.7–71.0) in the pre-intervention group (p=0.150). The most common gram-negative isolate across both groups was E. coli (28.7%), followed by K. pneumoniae (10.0%). The most common gram-positive isolates were MSSA (16.3%) and MRSA (7.5%). Median duration of anti-MRSA therapy was reduced from 49.38 hours (27.63–132.72) in the pre-intervention group to 27.92 hours (12.78–57.99) in the post-intervention group (p=0.035). There was no significant difference in total antibiotic days of therapy, duration of anti-pseudomonal therapy, length of stay, or in-hospital all-cause mortality between groups. Of the 22 recorded pharmacist interventions, 18 (81.8%) were accepted. The most common pharmacist intervention was therapy de-escalation (72.7%).
Conclusions: Rapid blood culture diagnostic kits used in conjunction with real-time electronic notifications of bacteremic patients to antimicrobial stewardship pharmacists further decreased median time to targeted therapy and significantly reduced duration of anti-MRSA therapy.
**Title:** Evaluation of a Human Immunodeficiency Virus pharmacy service

**Objectives:** When patients with Human Immunodeficiency Virus (HIV) are admitted to the hospital, antiretroviral therapy (ART) can be forgotten, improperly ordered, or interact with existing or new medication orders. The Infectious Diseases Society of America (IDSA) released a Call to Action to promote Antiretroviral Stewardship Programs (ARVSPs) and Infectious Diseases (ID) or HIV pharmacist involvement in institutions in order to reduce ART-related clinically significant drug-drug interactions (CSDDIs). The reduction of CSDDIs is critical to optimize ART as well as to prevent avoidable morbidity and mortality of patients who are being treated for co-morbidities. The primary objective of this evaluation was to identify the rate and types of ART-related medication errors that occur in admitted patients at our institution as well as to identify risk factors (e.g., regimen complexities) associated with medication errors.

**Methods:** Medical records of adult patients admitted between July 1, 2020 and November 30, 2021 who were ordered ART for the treatment of HIV during hospitalization were reviewed. Patients ordered ART for non-HIV morbidities (e.g., hepatitis B), pre- or post-exposure prophylaxis, or those who were discharged directly from the emergency department or the Crisis Response Center were excluded. Data was recorded in a secure REDCap Cloud database and analysis was preformed via IBM SPSS software.

**Results:** The rate and types of ART-related medication errors as well as risk factors associated with medication errors were recorded and results will be presented.

**Conclusions:** It is anticipated that this evaluation will demonstrate the important role for ARVSPs, and ID or HIV pharmacist involvement in institutions in order to reduce ART-related CSDDIs.
Cefpodoxime for spontaneous bacterial peritonitis prophylaxis: incidence of breakthrough infection

Objectives: Spontaneous bacterial peritonitis (SBP) is a common and severe infection with a poor prognosis in cirrhotic patients. Although guidelines recommend use of fluoroquinolones and sulfamethoxazole-trimethoprim (SMX-TMP) for SBP prophylaxis, a large proportion of patients at our institution receive prophylaxis with cefpodoxime for its favorable safety profile despite the lack of efficacy data. The long-term use of this agent raises the theoretical concern for increased SBP recurrence and the risk of cephalosporin-resistant pathogens. We seek to compare the efficacy of cefpodoxime in preventing breakthrough SBP infections to previously reported incidence with SMX-TMP and fluoroquinolones.

Methods: This retrospective, single-center cohort analysis will be submitted to the Institutional Review Board for approval. The electronic medical record at the Hospital of the University of Pennsylvania will be utilized to identify cirrhotic patients newly started on cefpodoxime for primary or secondary SBP prophylaxis during the time period of January 1, 2015, to December 31, 2020. Patients will not be included in our study if they received fluoroquinolones or SMX-TMP for other prophylaxis indications, received prophylaxis therapy for gastrointestinal bleed, or had no follow-up documentation within one year of therapy initiation. The primary endpoint will be the incidence of breakthrough infections within one year in patients who received cefpodoxime for both primary prophylaxis and secondary prophylaxis. Secondary endpoints will include 1-year all-cause mortality and SBP pathogens and susceptibility patterns isolated during the study timeframe. All data will be collected without patient identifiers and will be kept confidential. Descriptive statistics will be utilized to analyze baseline characteristics and data point collected.

Results: The number and percentage of breakthrough infections within 1 year in patients who received cefpodoxime for SBP prophylaxis and 1-year all-cause mortality rates will be presented.

Conclusions: We anticipate cefpodoxime prophylaxis to be equally as effective as non-cephalosporins in the prevention of SBP in patients with cirrhosis.
Abstract Title: Single Center Evaluation of Brief Functional Aminoglycoside Monotherapy for Ceftriaxone Non-susceptible Enterobacterales Bacteremia

**Objectives:** The objective of this study is to determine if there is a difference in clinical outcomes in adult patients with ceftriaxone resistant Enterobacterales bacteremia who receive empiric antibiotics with carbapenems versus a susceptible aminoglycoside and non-susceptible non-carbapenem.

**Methods:** It is a single-center, retrospective, observational cohort study of hospitalized adult patients with ceftriaxone non-susceptible Enterobacterales bacteremia between January 1, 2008, to June 30, 2019. Antibiotic susceptibilities from January 1, 2008, to May 2017 were determined by Vitek2, and isolates from May 2017 to June 30, 2019, were determined by Microscan. The study was conducted at Maimonides Medical Center (MMC), a 711 bed Academic Medical Center in Brooklyn, NY. Patients were selected from the electronic medical record (EMR) databases at MMC based on having a positive blood culture for ceftriaxone resistant Enterobacteriaceae. Patients who are 18 years or older with Enterobacterales bacteremia treated definitively with carbapenems for >24 hours and either received empiric carbapenem therapy or received in vitro non-susceptible penicillin or cephalosporin in addition to at least one dose of an in vitro susceptible aminoglycoside prior to final susceptibilities.

**Results:** Pending

**Conclusions:** We hypothesized that there will be no difference in 30-day mortality between the treatment arms. In terms of secondary outcomes, we hope to see no significant difference in 90-day mortality and 14-day clinical failure which is defined as death, or without clinical improvement at 14 days from index infection: failure to achieve reduction in WBC and/or fever. We will be assessing the appropriateness of aminoglycoside dosing and dose dependent nephrotoxicity and incidence of acute kidney injury.
Title: Effect of bamlanivimab-etesevimab on hospitalizations and death in patients with COVID-19 in a community hospital setting

Objectives: The monoclonal antibodies bamlanivimab and estesevimab received emergency use authorization to treat SARS-CoV-2 in patients who are at high risk for progression of the disease. The objective of this study is to investigate the effect of bamlanivimab-estesevimab on clinical outcomes including hospitalization and death in patients with mild-moderate COVID-19. Additionally, this study investigated the effect of the predominant variant as well as vaccination status on the clinical outcomes.

Methods: A retrospective analysis of patients who received bamlanivimab-estesevimab during a seven-month period was completed. Patients who received bamlanivimab-estesevimab at Middlesex Health were included and patients who received bamlanivimab monotherapy or hospitalization and/or death due to another cause other than COVID-19 were excluded from analysis. Data that was collected included baseline characteristics, length of time from date of positive COVID-19 test to date of administration, hospitalization, length of stay if hospitalized, vaccination status, which vaccine was received, and the predominant variant as reported through the Connecticut variant tracking reporting system.

Results: From March 1, 2021 to September 30, 2021 a total of 112 patients received bamlanivimab-estesevimab. A total of 12 patients were hospitalized within 30 days of administration. Out of the 12 patients, 9 patients received bamlanivimab-estesevimab during their hospitalization and 3 patients were hospitalized 4 days (average) after administration of bamlanivimab-estesevimab. The 9 patients that had received treatment during their hospital admission were admitted due to another indication or worsening symptoms. There were no deaths reported in the study population. A total of 52 patients were not vaccinated, 14 patients were partially vaccinated, 44 patients were fully vaccinated, and 2 patients had an unknown vaccination status. Of the 9 patients that were hospitalized during their admission, 5 were not vaccinated and 4 were fully vaccinated. Of the 3 patients that were hospitalized post infusion 2 were not vaccinated and 1 was partially vaccinated. Majority of patients vaccinated received the Pfizer vaccine and the dominant variant was delta.
Conclusions: Bamlanivimab-etesevimab displayed positive outcomes on hospitalization and death in patients who are diagnosed with COVID-19 who were at high risk of progression of disease.
Practical utility of methicillin-resistant Staphylococcus aureus nares polymerase chain reaction screening to support antimicrobial stewardship efforts for vancomycin de-escalation at a tertiary medical center

Presenter Name: Tokatli, Nicole
Organization: UMass Memorial Medical Center (UMMMC), Worcester, Massachusetts
Category: Infectious Diseases
Day | Session | Room | Time: Monday | 2 | Magnolia C | 4:30:00 PM

Authors: N. Tokatli, PharmD, J. Lomanno, PharmD, BCIDP, M. Bear, PharmD, M. Wessolosky, MD, MPH, M. Al Kateb, MD, M. Trivedi, MD, FACP, FHM, K. Belusko, PharmD, BCPS

Title: Practical utility of methicillin-resistant Staphylococcus aureus nares polymerase chain reaction screening to support antimicrobial stewardship efforts for vancomycin de-escalation at a tertiary medical center

Objectives: Methicillin-resistant Staphylococcus aureus (MRSA) is a leading cause of healthcare-associated infections. This often leads to the addition of empiric MRSA coverage with vancomycin in hospitalized patients. The MRSA nasal polymerase chain reaction (PCR) has been shown to have a high negative predictive value (NPV) and is currently utilized at UMass Memorial Medical Center (UMMMC) to de-escalate empiric MRSA coverage in patients with suspected pneumonia. There is increasing evidence for the use of the MRSA nasal PCR to guide de-escalation of vancomycin therapy in sources of infection outside of the respiratory tract. This study aims to determine the institutional NPV of the MRSA nasal PCR at UMMMC for bloodstream, intra-abdominal, respiratory, wound, and urinary sources of infection.

Methods: A retrospective chart review will be performed for adult patients with a MRSA nasal PCR result while receiving vancomycin from January to March 2022 at UMMMC. Bloodstream, intra-abdominal, respiratory, wound, and urinary culture results within seven days of the PCR test will be assessed for growth of MRSA to determine the NPV at UMMMC. Data will be reviewed to determine de-escalation of vancomycin in response to the MRSA nasal PCR result, as well as rates of acute kidney injury.

Results: The negative predictive value of the MRSA nasal PCR at UMMMC including bloodstream, intra-abdominal, respiratory, wound, and urinary infections will be presented.

Conclusions: The results of this study are expected to provide data that will help support decision making and antimicrobial stewardship efforts for optimal empiric MRSA coverage at UMMMC.
Tran, Thuan

Utility of Methicillin-resistant Staphylococcus aureus nasal Polymerase Chain Reaction (PCR) screening for antimicrobial stewardship at two community-teaching hospitals

Conference Abstracts
May 16-18, 2022

Presenter Name: Tran, Thuan
Organization: Cambridge Health Alliance
Category: Infectious Diseases
Day | Session | Room | Time: Monday | 2 | Magnolia B | 3:30:00 PM

Authors: Thuan Tran, PharmD; Amanda Barner, PharmD, BCPS, BCIDP; Xia Thai, PharmD, BCPS; Louann Bruno-Murtha, DO; Rebecca Osgood, MD; Kenneth Atwell, BA

Title: Utility of Methicillin-resistant Staphylococcus aureus nasal Polymerase Chain Reaction (PCR) screening for antimicrobial stewardship at two community-teaching hospitals

Objectives: Methicillin-resistant Staphylococcus aureus (MRSA) infections are associated with high morbidity and mortality. In the Cambridge Health Alliance (CHA) inpatient population, 28% of all Staphylococcus aureus isolated were MRSA in 2020. Current IDSA guidelines recommend empiric antibiotic therapy against MRSA in patients with risk factors. Traditional culture and susceptibility testing can take up to 72 hours to result, and providers often hesitate to de-escalate antimicrobial regimens with the removal of MRSA coverage, especially in the acutely ill patient population. Potentially extraneous antibiotic exposures have been associated with an increased risk of antimicrobial drug resistance, antibiotic-associated adverse drug events (nephrotoxicity, allergic reactions, Clostridioides difficile infections), and possibly higher 30-day mortality. Emerging evidence around the use of MRSA nasal PCR swabs has shown that it could be a valuable tool to guide antimicrobial stewardship. However, the utility of the nasal swab is highly dependent on the population prevalence. Thus, it is imperative to look at CHA's population.

Methods: The study is a multi-center, retrospective cohort study conducted from January 1, 2018, to October 1, 2021, at the CHA Cambridge and Everett Hospitals. A data analytics report will be used to collect data for the study. Patients over 18 years old who are admitted with MRSA nares swab results at the time of the index admission. Additionally, patients must have clinical cultures (tissue, bone, wound, blood, body fluid, and respiratory) collected during the index admission to be eligible for the study. Other information to be collected include patients' age, sex, and BMI. The primary outcome is the negative predictive value (NPV) of the MRSA nasal PCR swab in patients with the clinical cultures stated above. Secondary outcomes include the 30 day NPV in each type of clinical culture, 30 day NPV in patients with BMI higher than 30 kg/m², and the positive predictive value (PPV) in CHA's inpatient population. Other secondary outcomes include the test's sensitivity and specificity.

Results: The report includes 3220 instances where patients have clinical cultures collected within 30 days of an MRSA nasal PCR swab. The final result is pending data analysis. We expect a high NPV consistent with that of published literature.
**Conclusions:** Our result will be used to optimize a process by which pharmacists can order MRSA nares swabs for vancomycin consults.
**Title:** Pharmacist-Lead Interventions Impact on De-labeling Penicillin Allergies

**Objectives:** Research suggests, the majority of patients with a reported penicillin (PCN) allergy do not have a true allergy, and more than 95% of these patients can tolerate PCN and other beta lactams after subsequent testing. Almost all patients outgrow PCN allergies 10 years after the initial IgE-mediated reaction. Patients labeled with a PCN allergy are more likely to be treated with broad spectrum antibiotics which can negatively impact patient care, create antibiotic resistance, and increase cost. PCN skin testing is a lengthy process and often results in false positive tests. However, PCN oral challenge test are less costly and have shown to be effective. Our institution completed a retrospective chart review which revealed that majority of patients labeled with a PCN allergy did not have a true allergy and frequently received broad-spectrum antibiotics. We identified major stewardship opportunities for pharmacists to clarify allergies and intervene accordingly. The purpose of this project is to evaluate the effect of the oral challenge test on appropriately de-labeling patients, de-escalating antimicrobials, decreasing resistance, and preventing nosocomial infections.

**Methods:** A prospective chart review was performed from January to March 2022 on patients labeled with a Type I IgE mediated PCN allergy and receiving antibiotics. We excluded patients younger than 18 years old, COVID positive, intubated, pregnant, and/or had an adverse drug event documented rather than an allergy. Pharmacist interviewed patients to clarify the type of reaction, severity, how recent, and which antibiotics they tolerated in the past. If patients qualified for the oral challenge test, we obtained approval from the provider and the patient. If no reaction occurred patients were appropriately de-labeled. However, if a reaction was documented the allergy was updated as failing the challenge test and the patient was counseled. Lastly, the pharmacist placed a consult note documenting the results, informed the provider, and recommended de-escalation accordingly. The primary outcome of our study was to evaluate if pharmacist interventions by appropriately de-labeling patients decreased broad-spectrum antibiotics usage. The secondary outcome was to assess the impact of those interventions on the prevalence of MDR pathogens and nosocomial infections.

**Results:** Will be presented
**Conclusions:** We anticipate that this prospective study will play a tremendous role in stewardship by appropriately de-labeling patients listed as having PCN allergy, decreasing broad spectrum antibiotic usage, and improving resistance.
Evaluation of actual versus predicted vancomycin concentrations using an electronic dosing program in medical ICU patients at an urban academic medical center

Presenter Name: Upadhyay, Shreeya
Organization: Howard University Hospital; Howard University College of Pharmacy
Category: Infectious Diseases
Day | Session | Room | Time: Wednesday | 5 | Magnolia C | 2:00:00 PM

Authors: Shreeya Upadhyay, PharmD, MBA; Jesse Rung, PharmD, BCPS, FNKF; Erin Kozlow, PharmD, BCCCP

Title: Evaluation of actual versus predicted vancomycin concentrations using an electronic dosing program in medical ICU patients at an urban academic medical center

Objectives: Vancomycin is often used to treat infections caused by gram positive bacteria, including methicillin resistant Staphylococcus aureus (MRSA). Monitoring for vancomycin is required to monitor the safety and efficacy of the drug. Additionally, if the vancomycin concentration does not meet a minimum threshold, the patient may not achieve bacterial eradication and may make the patient susceptible to infections caused by resistant organisms. Conversely, overdosage of vancomycin can lead to toxicities. The 2020 vancomycin guidelines released by the Infectious Diseases Society of America recommend using AUC:MIC instead of troughs for dosing and monitoring in patients with serious MRSA infections. The purpose of this study is to determine if there is a difference between the actual obtained vancomycin level and the predicted vancomycin level using an electronic dosing program in critical care patients.

Methods: Adult patients aged 18 years and over located in the medical intensive care unit (MICU) on vancomycin were eligible for study enrollment. Patients must have had a peak and trough drawn from the same dosing interval. Patients who were on hemodialysis, had end stage renal disease, or acute kidney injury were excluded from the study. Each pair of levels was used to calculate the percent difference between the predicted and actual vancomycin level with and without the critically ill function. Other outcomes that were calculated were the percent of patients at therapeutic level and change in renal function. Additional covariates that were collected included age, race, indication, and concurrent use of nephrotoxic medications.

Results: Final results will be recorded and presented.

Conclusions: It is anticipated that the difference between actual and predicted vancomycin AUC:MIC will be within 10% of each value accounting for pharmacodynamic changes in critically ill patients.
Assessment of the efficacy of Methicillin resistant Staphylococcus aureus (MRSA) nasal screening in reducing vancomycin days of therapy

Objectives: The overuse of vancomycin is an increasing problem and can contribute to unnecessary nephrotoxicity in patients. Recent literature has shown that nasal screening of Methicillin resistant Staphylococcus aureus (MRSA) has a high negative predictive value in ruling out true MRSA infections (Mergenhagen et al., 2019). The objective of this study is to assess how effective MRSA nasal swabs are in reducing vancomycin days of therapy after implementation of MRSA nasal swab use at this hospital.

Methods: Patients who received at least one dose of vancomycin were identified using a clinical surveillance system and randomized to select 70 patients in the pre- and post-implementation group. Inclusion criteria consisted of patients who have received at least one dose of vancomycin and resulted in a negative MRSA nasal PCR and exclusion criteria consisted of patients with a positive MRSA PCR result, hemodialysis patients, pediatrics, and same day surgery/OR. The data collected included: clinical indication, MRSA swab result, source of infection, involvement of Infectious Disease providers, and vancomycin days of therapy; these data points were analyzed using the Mann Whitney U test given that the distribution of data were non-parametric and results are reported as descriptive statistics.

Results: The vancomycin days of therapy resulted in an average of 2.21 ± 3.27 for the pre-group and 1.38 ± 0.59 for the post-group, resulting in a statistically significant difference (p =0.003). There was not a statistically significant difference when observing hospital length of stay (p=0.456). MRSA risk factors were also observed, and approximately 55% of patients had risk factors for MRSA. Involvement of an Infectious Disease provider occurred approximately 75% of the time. The negative predictive value of the MRSA nasal swab results was 95.31%, showing consistent findings with previous literature.

Conclusions: The implementation of MRSA nasal swabs resulted in a statistically significant difference in reduction of vancomycin days of therapy. Further studies would be necessary to assess whether the reduction of vancomycin results in decreased antibiotic resistance as well as decrease in rates of acute kidney injury. MRSA nasal swabs should continue to be used as a tool to guide antibiotic de-escalation.
Pre-post Study Evaluating Efficacy of the DRIP Score in the Emergency Department

Objectives: Community acquired pneumonia (CAP) is responsible for ~1 million emergency department (ED) visits yearly and is the leading cause of infection-related deaths. Given that increasing antibiotic resistance rates complicate appropriate empiric antibiotic selection, clinicians may benefit from tools to help identify patients at risk for drug-resistant pathogens (DRPs). Limitations of traditional tools, such as healthcare-associated pneumonia criteria (HCAP), have led to development of novel scoring tools such as the drug resistance in pneumonia (DRIP) score. The DRIP score has shown to reduce broad spectrum antibiotic use in patients with CAP without causing inadequate coverage or increased 28-day readmission. The objective of this study is to evaluate the effect of the DRIP score on appropriate antibiotic use, therapeutic outcomes, mortality, and length of stay in patients who present to the ED with CAP at an academic and community hospital.

Methods: This is an IRB approved, quasi-experimental, pre-post implementation study of the DRIP score in patients who presented to the ED with CAP. Patients were retrospectively evaluated prior to implementation of the DRIP score October 2018-May 2019 and prospectively collected post implementation of the DRIP score January-February 2022. Data was collected through the electronic medical record. Patients were included if they were ≥18 years diagnosed with CAP by radiographic evidence and culture positivity with susceptibility results. Exclusion criteria were: presence of non-bacterial non-respiratory pathogens, patients with cystic fibrosis, lung transplant, or systemic co-infections. The primary endpoint of this study is the difference in broad-spectrum antibiotic use pre-and post-DRIP score implementation. Secondary outcomes include length of stay, duration of antibiotics, growth of DRPs, and 30-day all-cause mortality and readmission. For the statistical analysis, categorical variables will be compared using the Chi-squared test, continuous variables will be compared by the Student t-test or Mann-Whitney U test, and logistic regression will be used to help control confounding factors.

Results: Pre- and post-DRIP score implementation treatment outcome data will be analyzed, and the results will be presented.
Conclusions: It is anticipated that this project will demonstrate that DRIP score implementation will lead to less broad-spectrum antibiotic use without increasing the length of stay or the risk of 30-day mortality or readmission.
Conference Abstracts  
May 16-18, 2022

Presenter Name: Vijapurapu, Sandhya  
Organization: Penn Presbyterian Medical Center  
Category: Infectious Diseases  
Day | Session | Room | Time: Wednesday | 6 | Empire B | 3:30:00 PM

Authors: Sandhya Vijapurapu, PharmD; Christina Maguire, PharmD, BCIDP; Amanda Binkley, PharmD, BCIDP, AAHIVP; Shawn Binkley, BS, PharmD, BCIDP; Raymond Lamore, PharmD, BCCCP

Title: Evaluation of Antimicrobial Susceptibility Patterns for Patients Admitted from Post-Acute Care Facilities in the Philadelphia Region

Objectives: Antimicrobial resistance is a rapidly emerging threat and antibiograms are a key component in guiding empiric antimicrobial selection. Patients admitted from post-acute care facilities are at a heightened risk for infections from multi-drug resistant organisms, posing a challenge for healthcare professionals selecting empiric therapy. The currently available ambulatory antibiogram for Penn Presbyterian Medical Center (PPMC) and the Hospital of the University of Pennsylvania (HUP) does not differentiate antimicrobial susceptibilities for patients presenting from the community and those presenting from another facility. Therefore, this study aimed to characterize positive cultures and empiric antimicrobial regimens for patients admitted from post-acute care facilities in the Philadelphia region.

Methods: This was a retrospective quality improvement study conducted on patients admitted from August 2020 to June 2021. This study included patients admitted to PPMC or HUP from a post-acute care facility with positive cultures within 72 hours of admission. Post-acute care facilities were defined as a skilled nursing facility (SNF), inpatient rehabilitation facility (IRF), or long-term acute care hospital (LTACH). Appropriate therapy was determined based only on a comparison of empiric antimicrobial selection and susceptibilities that resulted from collected cultures. Descriptive statistics were employed for data analysis.

Results: A total of 106 patients and 110 admissions were evaluated, of which approximately 90% of samples were from patients admitted from SNFs. The majority of patients received initial empiric coverage for Pseudomonas aeruginosa and methicillin-resistant Staphylococcus aureus. Over 50% of all cultures had been obtained from urinary sources. Of cultures that grew Gram-positive organisms, Enterococcus spp. was isolated the most frequently (61%). Gram-negative organisms in our study exhibited greater antimicrobial resistance in comparison to institution-reported antimicrobial resistance.

Conclusions: Antimicrobial susceptibility was significantly discordant amongst patients admitted from post-acute facilities in the Philadelphia region compared to our current ambulatory antibiogram. The resistance demonstrated indicates a need for change in the
prescribing patterns of empiric antimicrobials. Future directions include consideration of agents such as carbapenems or double-coverage with a beta-lactam and aminoglycoside for initial empiric therapy given the observed resistance trends.
Impact of BioFire® Blood Culture Identification (BCID) panels on time to optimal antimicrobial therapy

**Objectives:** Blood stream infections are life-threatening events associated with significant morbidity, mortality, and costs that require timely initiation of effective treatment for optimal outcomes. However, patients are often treated with multiple antimicrobials that may not be optimal until the offending pathogen is identified. Traditional microbiological techniques require up to 72 hours to identify the organism, but the development of rapid blood culture identification polymerase chain reaction panels has expedited this process. At Atlantic Health System, the BioFire® FilmArray® blood culture identification panel was implemented in June 2020 (BCID1), with subsequent upgrade to BICD2 in March 2021. Key upgraded targets include speciation of Enterococcus spp. and the addition of multiple gram-negative resistance genes. The purpose of this study is to assess time to optimal antimicrobial therapy after implementation of the BICD1 and BICD2 platforms compared to an historical time period for select organisms.

**Methods:** This retrospective study of hospitalized, adult patients was conducted at two community teaching hospitals between May 2019 to December 2021. Patients with a blood culture positive for Enterococcus faecalis, Enterococcus faecium, Proteus spp., Escherichia coli, or non-aerogenes Klebsiella spp. were included. Patients with polymicrobial bacteremia or presumed polymicrobial source of bacteremia, positive blood cultures within 90 days prior to admission, who were pregnant, or who were deceased or made comfort care at time of Gram stain were excluded. The primary endpoint was time to optimal antimicrobial therapy, defined as the time from blood culture collection to the start of a pathogen-specific regimen. Secondary endpoints included time to effective antimicrobial therapy (defined as time from blood culture collection to initiation of antimicrobial therapy to which the organism was found to be susceptible), inpatient length of stay, 30-day readmission, recurrence or reinfection within 30 days of discharge (defined as growth of the same organism from a blood culture), and all-cause 30-day mortality.

**Results:** The time to optimal antimicrobial therapy along with key secondary endpoints will be analyzed, and the results will be presented.
Conclusions: Due to rapid organism identification and/or resistance gene detection, it is anticipated that time to optimal antimicrobial therapy will be shorter in the BCID1 and BCID2 groups compared to the pre-BCID group, with use of BCID2 resulting in the shortest time overall.
Authors: A. Wallin, G. Joung, O. Alfaouri; Englewood Hospital and Medical Center (EHMC), Englewood, New Jersey

Title: Casirivimab plus imdevimab versus bamlanivimab monotherapy versus bamlanivimab plus etesevimab: effect on 30-day hospitalizations for COVID-19 at a community hospital

Objectives: Coronavirus disease 2019 (COVID-19) has continued to cause an enormous disease burden globally, causing hospitalizations and deaths among those affected. Anti-SARS-CoV-2 monoclonal antibodies have received Emergency Use Authorization (EUA) by the Food and Drug Administration (FDA) and have been utilized for the treatment of nonhospitalized patients with mild to moderate COVID-19 at high risk for progression to severe disease and/or hospitalization. Limited data exists regarding the comparative efficacy of one monoclonal antibody treatment versus another, which may prevent patients from receiving optimal treatment.

Methods: Medical records of patients who received bamlanivimab monotherapy, bamlanivimab plus etesevimab, or casirivimab plus imdevimab in the emergency department or outpatient infusion center at EHMC for the treatment of mild to moderate COVID-19 from November 19, 2020 to December 31, 2021 were reviewed. Data was collected utilizing epic reports and excel spreadsheets to analyze baseline characteristics and the number of 30-day hospitalizations following monoclonal antibody treatment. Patients were included if they were greater than or equal to 18 years of age and received at least one dose of COVID-19 monoclonal antibody, and excluded if they were less than 18 years of age, hospitalized for COVID-19, or receiving oxygen therapy for COVID-19. This study has been approved by the EHMC Institutional Review Board (IRB).

Results: The number of 30-day hospitalizations following monoclonal antibody treatment will be recorded and results will be presented.

Conclusions: It is anticipated that this study will help to understand the effectiveness of monoclonal antibody products under EUA for the treatment of patients at high risk for progression to severe COVID-19.
Presenter Name: Walters, Jillian
Organization: Johns Hopkins Health System, Baltimore, Maryland
Category: Infectious Diseases
Day | Session | Room | Time: Wednesday | 6 | Empire C | 3:00:00 PM

Authors: Jillian Walters, PharmD, MPH; Angela Perhac, PharmD, BCIDP; Dave Procaccini, PharmD, MPH, BCPS, BCPPS, CACP, CPHQ; Stephanie Davis, PharmD, BCIDP, BNCCP, CNSC; Glenn Whitman, MD; Umair Ansari, PharmD, MBA, BCIDP, BCPS; Valeria Fabre, MD; Michael Grant, MD; Bret

Title: Evaluation of microbiology and empiric antibiotic therapy for treatment of cardiac surgical site infections

Objectives: Surgical site infections (SSIs) are associated with significant morbidity and mortality after cardiac surgery. Most cardiac SSI causative organisms are gram positive species; however, gram negative species have also been isolated. Both Infectious Diseases Society of America and institutional guidelines recommend empiric antibiotic regimens primarily targeted towards treating gram positive species and lack strong supporting clinical evidence. This study aims to describe common pathogens and evaluate the effectiveness of empiric antibiotic regimens for the treatment of adult and pediatric patients with cardiac SSIs.

Methods: This study is a retrospective, single center, cohort study that includes adult and pediatric patients hospitalized with cardiac SSIs at an academic medical center between July 1, 2016 and June 30, 2021. Patients were identified using the Society for Thoracic Surgery (STS) database and were included if they had a cardiac SSI reported in the database and received empiric antibiotics for cardiac SSI while hospitalized. Cardiac SSIs that were included were deep SSI, superficial SSI, mediastinitis, thoracotomy site infection, cannulation site infection, and saphenous vein graft harvest site infection. Patients with pacemaker placement-related infections were excluded. Data collected include patient characteristics, type of cardiac SSI, empiric antibiotic regimens, and culture and susceptibility data. Statistical analyses conducted included descriptive statistics for type of cardiac SSI, isolated microorganisms and susceptibilities, and empiric antibiotic regimens. Chi-squared tests for categorical outcomes, Student's t-test for parametric, continuous data, and Wilcoxon-Mann Whitney test for nonparametric, continuous data will be used for subgroup analyses.

Results: Results to follow. The number and percentages of cardiac SSIs, isolated microorganisms and their susceptibilities, and empiric antibiotic regimens will be reported. Further analyses will evaluate whether guideline-recommended or prescribed empiric antibiotic regimens have activity against identified microorganisms and whether empiric antibiotics were
appropriate. These outcomes will also be compared in predefined subgroups such as depth of infection, site of infection, timing after surgery, and adult versus pediatric populations.

**Conclusions:** It is anticipated that this project will provide further insight into microbiology of cardiac SSIs to determine appropriate empiric antibiotic therapy based on patient-specific factors.
Presenters Name: Wambi, Nancy  
Organization: Bayhealth Medical Center  
Category: Infectious Diseases  
Day | Session | Room | Time: Wednesday | 6 | Empire C | 3:30:00 PM 

Authors: N. Wambi, T. Mullen, A. Kashmanian, J. Caruano  

Title: Quasi-experimental study comparing outpatient antibiotic prescribing practices for the treatment of acute respiratory infections before and after implementing an antibiotic stewardship program  

Objectives: Acute respiratory tract infections are the most common reason for outpatient antibiotic prescriptions. Due to the frequency of acute respiratory infections predominantly caused by viruses, the outpatient primary care setting is an important focus when addressing antibiotic resistance and inappropriate antibiotic prescribing. This study examined outpatient antimicrobial prescribing patterns for acute respiratory infections before and after implementation of an antimicrobial stewardship intervention, comparing prescribing patterns to national benchmarks.

Methods: This study was a quasi-experimental study examining antibiotic prescribing patterns for eight outpatient primary care practices for acute respiratory infections. Aggregate antimicrobial prescribing data were compared to national benchmarks, and patients' medical records were reviewed to identify possible antibiotic adverse events. The primary endpoint was the number of antibiotic prescriptions written per 100 visits for acute respiratory infections, and secondary endpoints included appropriate antibiotic selection per published guidelines, type of antibiotic class, and the number of patients having an emergency department visit or hospital admission from an antibiotic-related adverse reaction within 30 days of the initial prescription.

Results: The number of antibiotic prescriptions written for an acute respiratory infection per 100 visits at outpatient primary care sites before and after an antibiotic stewardship intervention will be recorded. The results will be presented.

Conclusions: It is anticipated that the results of this study will demonstrate that implementing antimicrobial stewardship interventions can improve outpatient antibiotic prescribing practices for acute respiratory infections.
Conference Abstracts
May 16-18, 2022

Presenter Name: Watchorn, Patrick
Organization: Penn State Health Milton S. Hershey Medical Center
Category: Infectious Diseases
Day | Session | Room | Time: Monday | 2 | Magnolia C | 4:15:00 PM

Authors: Patrick Watchorn, PharmD; Lindsay Trout, PharmD, BCPPS; Kevin Mulieri, PharmD, BCPPS; Theodore Demartini, MD; Robert Kavanagh, MD

Title: Preventing pediatric central-line infections associated with alteplase administration: can post-alteplase antibiotics help?

Objectives: After an increased incidence of central-line associated bloodstream infections in pediatric intensive care unit patients, our institution implemented a unit guideline for single-dose therapeutic piperacillin-tazobactam post-alteplase administration in an effort to reduce the incidence of these infections. The purpose of this study is to assess the effect of single dose piperacillin-tazobactam on reducing the occurrence of central line-associated bloodstream infections after alteplase has been used to clear an obstructed central line in pediatric intensive care unit patients. The primary objective is the occurrence of central line associated blood stream infection rate in patients receiving single-dose piperacillin-tazobactam after alteplase administration in comparison to patients not receiving single-dose piperacillin-tazobactam therapy after alteplase administration.

Methods: In this retrospective chart analysis conducted at a tertiary medical center, we evaluated pediatric intensive care unit patients from January 1, 2014 through August 01, 2021 who received alteplase for central line occlusion clearance. Excluded from this study were incidences of patients receiving therapeutic piperacillin-tazobactam or antibiotics with similar coverage prior to alteplase administration and confirmed central line infections associated with fungal or mycobacterial infections.

Results: Data analysis is currently in progress and will include evaluation of 250 patients. The incidence of central-line associated blood stream infections in relation to total alteplase administrations during study period will also be assessed.

Conclusions: Conclusions will be stated at final presentation.
Title: Risk factors for mortality of infections caused by carbapenem-resistant Acinetobacter baumannii (CRAB) compared to carbapenem-susceptible A. baumannii (CSAB)

Objectives: Carbapenem-resistant Acinetobacter baumannii (CRAB), an opportunistic pathogen primarily associated with hospital-acquired infections (HAI), is an urgent public health threat in the US. The increasing rate of A. baumannii antibiotic resistance to current therapy is a concern as more isolates are gaining resistance through various unique mechanisms. Currently, there remains limited information regarding incidence and mortality in patients with infections caused by CRAB. This study will plan to identify risk factors of mortality among patients with carbapenem-resistant A. baumannii (CRAB) compared to carbapenem-susceptible A. baumannii (CSAB) infections at TBHC.

Methods: This is a single-center, retrospective, case-control study evaluating patients with confirmed Acinetobacter baumannii infections from January 1, 2016 to December 31, 2021. The inclusion criteria will be patients who are 18 years of age or older who have a culture-confirmed A. baumannii infection. The exclusion criteria are patients with documented colonized infection without treatment. Of those included, the patients will be divided into two groups: one consisting of CRAB infections and the other group will have the CSAB infections. The primary endpoint will be risk factors for 30-day mortality in patients with CRAB compared to non-CRAB infections. The secondary endpoint will be length of hospital stay, length of intensive care unit (ICU) stays, incidence of nephrotoxicity, and antibiotic days of therapy. Safety endpoint will also be assessed with rates of nephrotoxicity, neurotoxicity, incidence of C. difficile infection, and gastrointestinal disturbance. Data will be analyzed and compared between groups using descriptive statistics, Fisher's exact test or Chi square test (categorical), student t-test (parametric), Mann-Whitney U test (non-parametric), and logistic regression.

Results: The data for primary, secondary and safety endpoint will be recorded and results will be presented.

Conclusions: It is anticipated that this project will determine related mortality risk factors in patients with CRAB infections compared to patients with CSAB infections. This study will add to existing literature evaluating the mortality outcome in patients being treated for CRAB infections and may be used to optimize empiric antibiotic selection.
Evaluating the effect of antimicrobial stewardship interventions in primary care clinics

**Objective:** Antimicrobial stewardship in the outpatient setting is a growing area of focus for national organizations like the Centers for Disease Control and Prevention (CDC) and The Joint Commission (TJC). Outpatient antimicrobial stewardship initiatives are well-documented to improve rates of unnecessary and inappropriate antibiotic prescribing. We aimed to evaluate the current prescribing patterns in affiliated primary care clinics and the effects of targeted antimicrobial stewardship interventions on the rate of inappropriate antibiotic prescribing.

**Methods:** Antibiotic prescriptions from three primary care clinics prescribed from January 1, 2021 to July 31, 2021 were reviewed to determine existing prescribing patterns. Afterwards, the investigators implemented internal clinical guidelines for commonly identified infections and provided education to primary care providers. Antibiotics prescribed from February 23, 2022 to April 30, 2022 were then evaluated to assess the change in prescribing patterns. Prescriptions were evaluated for appropriateness and were only considered appropriate if they met all three criteria: appropriate drug, dose, and duration. The evaluation of appropriateness was based on national guidelines from the Infectious Diseases Society of America (IDSA) and other professional organizations.

**Results:** The effect of the antimicrobial stewardship interventions on the rate of inappropriate prescribing will be analyzed. The results are to be presented.

**Conclusions:** We expect to find a decreased rate of inappropriate antibiotic prescribing after the implementation of tailored clinical guidelines and provider education sessions.
Conference Abstracts
May 16-18, 2022

Presenter Name: Zimmerman, Matty
Organization: The Johns Hopkins Hospital, Baltimore, Maryland
Category: Infectious Diseases
Day | Session | Room | Time: Monday | 1 | Magnolia B | 2:00:00 PM

Authors: M. Zimmerman, P. Tamma, J. Lee, K. Dzintars, C. Soto, A. Hsu

Title: Defining effective treatment durations for patients with bloodstream infections caused by non-fermenting gram-negative bacteria: a multicenter observational study

Objectives: Antibiotic resistance continues to be a major threat to the health of our communities and to the longevity of antibiotic agents. Prolonged antibiotic courses are associated with antibiotic resistance, increased drug-related adverse events, increased occurrence of Clostridioides difficile infections, and unnecessary costs and inconvenience for patients. Results from randomized controlled trials have indicated that approximately 7 days of therapy is sufficient for the treatment of gram-negative blood stream infections (BSIs), however only 4.3% of BSI episodes included across these studies were caused by non-fermenting gram-negative bacteria such as Pseudomonas species, Acinetobacter species, or Stenotrophomonas maltophilia. The purpose of this multicenter observational study is to determine if short course antibiotic therapy is associated with similar clinical outcomes as prolonged course antibiotic therapy in adults with non-fermenting gram-negative bacteremia.

Methods: We conducted a retrospective observational study of hospitalized adult patients with BSIs caused by non-fermenting gram-negative bacteria admitted between January 1, 2019 and December 31, 2019. Information regarding demographics, medical conditions, source of infection and presence of source control, microbiologic data, antibiotic treatment, and post-treatment outcomes was collected. Short course was defined as <10 days of exposure to antibiotics and prolonged course was defined as >10 days. Baseline demographics will be compared using the Fisher's exact test for categorical data and Wilcoxon rank-sum test for continuous data. To balance differences with respect to baseline characteristics between the 2 groups, inverse probability of treatment weighting will be performed. Multivariable logistic regression will be used to create propensity scores for each patient with the dependent variable being a binary outcome of short vs. prolonged duration of antibiotic treatment. Odds ratios (ORs) and 95% confidence intervals (CIs) for the primary and secondary outcomes will be estimated using weighted regression. Statistical significance will be defined as a p value <0.05.

Results: A total of 445 patients met eligibility criteria. The primary outcome of interest was odds of 30-day post-treatment all-cause mortality; secondary outcomes of interest included odds of recurrent bloodstream infection within 30 days post-treatment, odds of developing further resistance within 30 days post-treatment, and odds of adverse events within 30 days post-treatment.
treatment, including Clostridioides difficile infection and central line complications. The findings of the primary and secondary outcomes are forthcoming.

Conclusions: It is anticipated that this study will demonstrate whether bloodstream infections caused by gram-negative non-fermenting bacteria can be treated with shorter courses of antibiotic therapy without compromising clinical outcomes.
Assessment of antimicrobial prescribing patterns in patients with asymptomatic bacteriuria in a community teaching hospital

**Objectives:** Current Infectious Disease Society of America (IDSA) clinical guidelines recommend against screening and treating asymptomatic bacteriuria (ASB) due to lack of clinical benefit, except in pregnant women, patients undergoing a kidney transplant or an invasive urologic procedure. The objective of this study is to assess prescribing patterns of antimicrobials in patients with asymptomatic bacteriuria at a community teaching hospital.

**Methods:** Electronic medical records of patients for the months of September 2020 to June 2021 were retrospectively reviewed and ICD-10 codes were used to identify patients with asymptomatic bacteriuria (ASB). The primary endpoint of the study was the proportion of patients with ASB treated with antimicrobials. Data collected included general patient demographics, type of antimicrobial used, duration of treatment, urine culture results, adverse drug events, 30-day readmission rates; descriptive statistics was used to analyze data.

**Results:** Out of 100 patients' charts that were reviewed, 68 patients (68%) with ASB were treated with antibiotics while 32 patients (32%) were not treated with antibiotics; p=0.0003. Treatment duration ranged from 1 to 17 days and positive urine cultures was a statistically significant factor in determining treatment with antibiotics (p=0.0157). Ceftriaxone was the most used antibiotic, 9 out of 68 patients (13%) were treated with fluoroquinolones, no patients developed any drug-related adverse events during treatment and 5 patients were readmitted for reinfection within 30 days.

**Conclusions:** The data from this study shows that a great proportion of patients with ASB are still being treated inappropriately, deviating from the IDSA guidelines for the management of patients with ASB. Providers can be educated on the recommendations by the IDSA for patients with ASB. Also, an algorithm for the treatment of patients with UTI can be used by providers to guide the diagnosis and management of these patients.
**Presenter Name:** Zysk, Stacey  
**Organization:** Salem Veteran Affairs Medical Center  
**Category:** Infectious Diseases  
**Day | Session | Room | Time:** Tuesday | 4 | Magnolia A | 3:30:00 PM

**Authors:** Stacey Zysk, Tanvi Patil, Meghan Akridge, Rebecca McCraven, Shikha Vasudeva

**Title:** A single center quasi-experimental retrospective evaluation of vancomycin area under the curve guided dosing on the incidence of nephrotoxicity in veteran patients

**Objectives:** Vancomycin, is widely used as treatment of choice for serious gram-positive infections and is associated with significant nephrotoxicity. 2020 IDSA guidance recommends the use of AUC/MIC-based dosing. The objective of this study was to compare the incidence of nephrotoxicity in the trough-based dosing group vs. the AUC/MIC-based dosing group at the Salem VA Medical Center.

**Methods:** This retrospective study included 100 patients who received trough-based dosing of vancomycin between January 1, 2017 and January 1, 2019 and 95 patients who received AUC/MIC-based dosing of vancomycin between October 1, 2019 and October 1, 2021 from the Salem VA Medical Center. Patients were excluded if they received less than 3 doses of vancomycin, had no steady state trough drawn, were undergoing dialysis, or if they had COVID-19 infection. Data was retrieved using structured query language from Corporate Database Warehouse (CDW) and manual chart review of electronic medical records. The primary outcome was nephrotoxicity in each group at 96 hours, 7 days, and total hospital admission. Nephrotoxicity was defined as an increase in serum creatinine of 0.5 mg/dL or ≥50% increase from baseline. Secondary outcomes included 30-day readmission and all-cause mortality rates, cumulative doses at 24, 48, and 72 hours, and percentage of patients considered at goal (i.e. AUC/MIC 400-600 or trough between 10-20 mg/L).

**Results:** At 96 hours, the trough-based dosing group had 21 patients with nephrotoxicity while the AUC/MIC-based dosing group had 7 patients (unadjusted HR [95% CI] = 0.32 [0.14-0.76] and adjusted HR [95% CI] = 0.28 [0.12-0.66]). At 7 days, the trough-based dosing group had 21 patients with nephrotoxicity while the AUC/MIC-based dosing group had 10 patients (unadjusted HR [95% CI] = 0.46 [0.22-0.98] and adjusted HR [95% CI] = 0.39 [0.18-0.85]). For total nephrotoxicity, the trough-based dosing group had 21 patients with nephrotoxicity while the AUC/MIC-based dosing group had 12 patients (unadjusted HR [95% CI] = 0.53 [0.26-1.08] and adjusted HR [95% CI] = 0.46 [0.22-0.95]). Secondary outcomes showed no statistical difference between the two cohorts except significantly higher proportion of patients were considered at goal in the AUC/MIC cohort compared to trough-based dosing (p-value=0.001).
**Conclusions:** Most vancomycin associated nephrotoxicity occurred within 96 hours in both dosing strategies. AUC/MIC-based dosing strategies had significantly less nephrotoxicity than trough-based dosing. More patients were considered "at goal" in the AUC/MIC-based dosing group. This quality improvement project, as well as 2020 IDSA guidance, supports the use of AUC/MIC-based dosing of vancomycin.
Impact of a next-generation controlled substance diversion surveillance software program with advanced analytics capabilities

**Objectives:** Diversion of drugs within healthcare facilities presents an ongoing challenge for health-system leaders, as the risks associated with diversion can cause harm to patients and the diverter, and lead to significant financial burdens to the health-system. Massachusetts General Hospital previously utilized first-generation controlled substance surveillance software, which searches for diversion patterns based on automated dispensing cabinet data to pinpoint providers who have a statistically higher probability of diversion based on a pre-determined standard deviation. Newer systems, or next-generation software, differs due to its ability to utilize advanced algorithms to identify healthcare providers whose behavior differs from their peers. MGH recently implemented a next-generation controlled substance diversion software in place of current systems. The primary objective of this study was to evaluate the impact of the next-generation controlled substance software and its utility in identifying potential diversion and practice issues relating to controlled substances.

**Methods:** Retroactive data from the electronic health record and automated dispensing cabinets was collected over 18 months and delivered to the next-generation software’s integration platform to perform its advanced analysis and flag potential diversion or practice-related issues based on eight key metrics. All flagged users were plotted based on their eight metric scores and the average score and the time spent above a prespecified threshold average score, then the users above the 99th percentile were further evaluated. Correlation coefficients were calculated for each metric versus the averaged scores to determine which metrics provided most insight and visibility to the types of controlled substance discrepancies occurring at this institution.

**Results:** Over the 18-month study period, 5,727 users were reviewed in the next-generation surveillance platform, and 53 of those users fell above the threshold score for more than 99% of their worked days. Of the eight metrics evaluated for each user, the metrics with the most positive correlation to a high-score earning user were the variance trend score, dispense pattern score, and waste network scores, with correlation coefficients of 0.7, 0.6, and 0.6 respectively.
**Conclusions:** These results provide us with greater visibility as to what practice issues occur in our institution with controlled substances that could potentially lead to diversion down the line, as the top three metrics primarily relate to patterns in dispenses and matching administrations and waste. The three key metrics can also aid in targeting our education efforts for safer and proper use of controlled substances in the hospital.
Conference Abstracts
May 16-18, 2022

Presenter Name: Caveness, Christian
Organization: Maine Medical Center
Category: Informatics
Day | Session | Room | Time: Wednesday | 5 | Magnolia C | 12:30:00 PM

Authors: C. Caveness, PharmD; S. Rolfe, PharmD, BCCCP; S. Campbell, PharmD, BCPS; B. Kimball, PharmD; E. Herrle, MD; C. Peric, PharmD, BCPS; Maine Medical Center (MMC), Portland, Maine

Title: Medication warning override rates in the electronic health record by profession and level of training

Objectives: The aim of this study is to determine if medication warning override rates at Maine Medical Center differ between level of provider training and specialties. Additionally, the study will evaluate overall override rates and trends, investigate reasons for warning overrides, and evaluate provider behavior patterns.

Methods: This is a single-center, retrospective, observational study of resident physicians, attending physicians, and advanced practice providers (APP) at Maine Medical Center (MMC) between July 1, 2016 and June 30, 2021. Residents will be compared over time to attending physicians and APPs that work within their specialty to assess override rates at multiple levels of training. In addition, a 13-question survey will be sent to all providers at MMC in order to investigate their subjective impression of the utility of medication alerts and how their practice is changed by alerts. The primary outcome is to compare incidence of medication warning overrides between resident physicians and attending physicians/APPs within their specialty. The secondary outcomes are to describe override rates and trends between specialties, and to evaluate provider behavior assessed via survey.

Results: The overall trend of resident acceptance rates over time will be compared to attending physicians and APPs, as well as the results of the physician survey will be presented.

Conclusions: It is anticipated that this project will demonstrate an opportunity for resident education, and potentially a goal percentage for electronic health record warning acceptance rate to prevent alert fatigue, which has thus far not been well described in the literature.
Conference Abstracts
May 16-18, 2022

Presenter Name: Cole, Evan
Organization: The Johns Hopkins Hospital
Category: Informatics
Day | Session | Room | Time: Wednesday | 5 | Magnolia C | 12:45:00 PM


Title: Characterization of the frequency of critical medication doses missed or delayed during perioperative and floor-to-floor patient transfers

Objectives: Medication Administration Record (MAR) hold capability can be enabled in the electronic health record during patient transfers in which medications orders are in a “paused” state and doses are not shown as due. The purpose of this study was to quantify the incidence of delayed and missed doses of critical medications during the MAR hold period surrounding inpatient transfer events, and to analyze these patterns in the context of current transfer workflows.

Methods: A list of critical medications that could lead to worse patient outcomes when delayed or missed were identified and divided into five categories: antibiotics, antifungals, antivirals, antiepileptics, and immunosuppressants. MAR data for critical medications were collected in patients with at least one critical medication dose due during the MAR hold period surrounding transfer between floors or perioperatively. MAR hold times, due times occurring during MAR hold, and preceding and succeeding medication administration times were used to determine if delayed doses (administered greater than 1 hour after scheduled due time) or missed doses (administered after greater than 75% of scheduled dosing interval had elapsed) occurred, with the intent to compare patterns between drugs, drug classes, order frequencies, and transfer event types.

Results: During the 6-month study period, 1514 medication due times occurred while a critical medication order was on MAR hold. Of these due times, 1044 (69%) were either delayed or missed. Antibiotics accounted for the majority (79%) of due times evaluated, for which delays occurred 297 (25%) times, missed doses occurred 423 (35%) times, and multiple missed doses occurred 85 (7%) times. Around 50% of critical medication doses due with short dosing intervals (such as every 4 or 6 hours) were missed by one or more dosing intervals. Approximately 33% of critical medication doses due with long dosing intervals (such as every 12 or 24 hours) were delayed, while about 39% were missed. The majority (91%) of due times evaluated were on MAR hold during perioperative patient transfers.

Conclusions: MAR hold is commonly associated with dose delays and misses, which has potential negative consequences on patient outcomes. Improving MAR displays for operating
room staff to help identify critical medications due during procedures and altering the logic by which medications are placed on and removed from MAR hold may alleviate these delays. Our project team plans to educate staff of these findings and to implement workflow changes. Future plans are to compare pre- and post-intervention data to evaluate the effect of our interventions.
Authors: M. Nguyen, S. Ledan; Kaiser Permanente of the Mid-Atlantic States, Hyattsville, Maryland

Title: Impact of clinical decision support within the electronic medical record on opioid prescribing and dispensing

Objectives: The overprescribing of opioids continues to sustain the opioid epidemic, as taking opioids in higher doses or for longer durations can increase the risk of opioid use disorder, overdose, and death. To combat the high variability in opioid prescribing, clinical decision support tools, such as best practice alerts for computerized provider order entry and prescription verification, are available to support prescribers and pharmacists as they select and verify appropriate opioid regimens. This study seeks to examine the impact of the alerts within the electronic medical record and pharmacy system on initial opioid prescribing and dispensing.

Methods: A retrospective chart review was conducted at an integrated healthcare system with computerized provider order entry. Adult, opioid naïve patients, with no opioid use within the past 90 days, were included if they had an alert triggered in the electronic medical record when a prescriber attempted to order more than a 7-day supply of an opioid for non-cancer pain. Data was collected through alert reporting and analyzed by looking at a three-month range prior to and following the implementation of the 7-day supply opioid alert. The primary outcome measure is the percent change in the number of opioid naïve patients prescribed more than a 7-day supply from July 2020 to January 2021. The secondary outcome measure is the percent change in the number of opioid naïve patients dispensed more than a 7-day supply from December 2020 to June 2021. A chi-square test will be used to detect differences between the groups prior to and following the implementation of the alerts.

Results: A total of 3500 participants were screened for eligibility from which a randomized sample of 450 participants was retrieved for chart review. 360 participants met inclusion criteria and were identified as truly opioid naïve after reviewing the Maryland Prescription Drug Monitoring Program (CRISP). The percent change in the number of opioid naïve patients prescribed and dispensed more than a 7-day supply of an opioid during the defined pre- and post-implementation periods will be presented.

Conclusions: The best practice alert surrounding long duration opioid prescriptions in opioid naïve patients is anticipated to be effective in reducing inappropriate prescribing and dispensing. With the alerts in place, providers were equipped with the clinical decision support
tools to reduce the quantity of opioids prescribed, change frequency for use, or remove the order overall for opioid naïve patients. Pharmacists were further able to reduce the quantity of opioids dispensed based on the pharmacy system alert.
Pantos, Megan
Optimization of the emergency department culture review process through enhancement of the electronic medical record

Conference Abstracts
May 16-18, 2022

Presenter Name: Pantos, Megan
Organization: UConn Health
Category: Informatics
Day | Session | Room | Time: Wednesday | 5 | Magnolia C | 12:15:00 PM

Authors: Megan M. Pantos, Gillian Kuszewski, Jeffrey R. Aeschlimann, Daniel Vo, Nishi Patel, Stephen Bordonaro, Marissa Salvo, Youssef Bessada, Kevin W. Chamberlin, Cassandra R. Doyno

Title: Optimization of the emergency department culture review process through enhancement of the electronic medical record

Objectives: To assess the impact of an electronic clinical decision support (CDS) pathway on timing and quality of antimicrobial stewardship interventions occurring during culture review of patients discharged from the emergency department (ED).

Methods: This quality assurance/quality improvement study assesses the optimization of an existing culture review process utilized by ED providers, including: (1) a CDS build; (2) build validation by pharmacy; and (3) pilot use by ED providers. Inclusion criteria are adults ≥ 18 years old discharged from the ED with pending blood, urine, or wound cultures; excluded are those incarcerated in the department of corrections, left against medical advice, or a hospital admission. The primary outcome is time to stewardship intervention (days). Secondary outcomes include number of intervention opportunities, and number of ED return visits within 96 hours. Pre-implementation results will be compared to post optimization results.

Results: Pre-optimization culture results representing three months of the existing process were reviewed. During this analysis, 82% of cultures were identified as abnormal by manual nursing review and 20% required ED provider intervention. The median time to intervention was 2 days and 38% occurred in less than one day. Of the provider interventions, 38% were antibiotic initiations for positive cultures, 7% were antibiotic discontinuations for negative cultures, and 31% were an escalation or de-escalation of antibiotic therapy due to susceptibility reports. Of the cultures intervened on, 34% of patients returned to the ED within 96 hours, of whom 1 was admitted for sepsis. Data collected during validation over 28 days resulted in 81 cultures from 64 unique patients. Urine comprised 59% of cultures. Of the cultures analyzed, 70% were negative with an opportunity for antibiotic discontinuation and 27% were positive with an opportunity to initiate therapy. Lastly, 3% were identified as positive with inappropriate antibiotic coverage. Pending results to be presented will reflect the pilot phase to ED providers, and will include time to provider intervention, number, and type of intervention.

Conclusions: It is anticipated the optimized process will decrease the time to provider intervention. Currently, the median time to intervention is 2 days. The goal of the CDS pathway
is to decrease this time to less than 1 day. The interventions completed by ED providers is expected to be similar pre- and post-optimization. Based on the decreased time to provider intervention, the optimized process will continue with ongoing evaluation.
Conférence des abstracts  
May 16-18, 2022

**Presenter Name:** Pierre-Paul, Sasha  
**Organization:** Howard University Hospital  
**Category:** Informatics  
**Day | Session | Room | Time:** Wednesday | 5 | Magnolia C | 1:45:00 PM

**Authors:** Sasha Pierre-Paul PharmD, Jesse Rung, PharmD, BCPS, Xiang S. Wang, PharmD, PhD  
**Title:** Creating a machine learning tool to predict Acute Kidney Injury (AKI) in African American hospitalized patients

**Objectives:** African Americans are at great risk for acute kidney injury inpatient due to a multitude of genetic polymorphisms, co-morbid conditions and social inequities. Studies have been done to calculate risk of acute kidney injury, but none specifically to calculate risk for African Americans inpatient. The purpose of this study is to determine what risk factors for acute kidney injury are specific to African American patients. A machine learning predictor tool will utilize patient specific information to give an acute kidney injury risk probability.

**Methods:** The information that will be collected from patient medical charts includes medications used throughout the hospital stay. Patient demographics such as age, race and sex. Patient co-morbid conditions from medical history such having or not having hypertension, hyperlipidemia, diabetes and kidney disease. Patient's SrCr, GFR, weight, height, tobacco and illicit drug use and patient's length of stay. The outcomes of this analysis will be classified using regression, clustering, association rules mining, and visualization using WEKA, a data mining software platform to create a calculator. The goal would be to find significant characteristics that predict for AKI and the calculator will be able to give a probability of this AKI when all characteristics are entered into it. The categorical and binary variables with be analyzed using chi-square analysis or Fisher exact test. A multivariate logistic regression model will be used to determine whether the association between the variable and the primary outcome of AKI is confounded by baseline differences.

**Results:** Results will be presented

**Conclusions:** Conclusion will be presented
**Conference Abstracts**
May 16-18, 2022

**Presenter Name:** Sacdal, John Paul  
**Organization:** NewYork-Presbyterian Brooklyn Methodist Hospital  
**Category:** Informatics  
**Day | Session | Room | Time:** Wednesday | 5 | Magnolia C | 1:00:00 PM

**Authors:** John Paul Sacdal, May Jabra, Margaret Marshall, Yang Fan  
**Title:** Optimization of Automated Dispensing Cabinets for the Intensive Care Unit and Medical/surgical Floors  

**Objectives:** Automated dispensing cabinets (ADCs) are an integral part of the medication distribution system used by pharmacy departments throughout the hospital. Benefits of ADCs include timely acquisition and administration of medications, assisting in inventory management, improvement in medication safety, and reduction in drug diversion. Without proper management there can be interruptions in medication delivery due to ADC inventory stock-outs and expiring medications. The objective of this study is to evaluate the impact of ADC optimization through a standard days' supply method on performance metrics including inventory costs, vend-to-fill ratio, and stock-out percentages.

**Methods:** This prospective study will assess metrics pre-and-post intervention, approved by an expedited institutional review board (IRB) process. Ten Omnicell® ADCs will be optimized using the following interventions: Adjustment of periodic automatic replacement (PAR) and re-order levels, removal of medications not dispensed in the last 90 days, and stocking frequently requested medications. Adjustment of PAR and re-order levels will be based on the past 90-day usage to last for a 7-day supply (plus 9 vends) and 3-day supply, respectively. Medications on the hospital's override list and intravenous drips will be excluded from the interventions. A two-month pre-optimization period will be compared to a two-month post-optimization period. The primary endpoint will be change in baseline vend-to-fill ratio. Secondary endpoints include change in baseline stock-out percentage, change in average daily expired medications, and change in average daily inventory.

**Results:** Ten Omnicell ADCs were included for analysis. There was an improvement in vend-to-fill ratio between the pre-optimization group compared to the post-optimization group (9.02 ± 0.18 vs 11.65 ± 1.71; p=0.25, respectively) but this was not statistically significant. For the secondary endpoints, there was an increase stock-out percentage (1.18 ± 0.07 vs 1.30 ± 0.0003; p=0.26), decrease in average daily expired medications (11.69 ± 6.14 vs 2.52 ± 0.73; p=0.25), and decrease in average daily inventory (27809 ± 3057 vs 15031 ± 13231; p=0.32) between pre-optimization and post-optimization groups but these were not statistically significant.
Conclusions: Optimization of automated dispensing cabinets did not result in significant improvement to key performance metrics including vend-to-fill ratio, stock-out percentages, average expired medications, and average inventory. Future direction of this study includes stocking frequently requested medications from the electronic health record and evaluating change in medications dispensed from central pharmacy to better characterize the benefits of an ADC optimization process.
Monoclonal antibodies may reduce return visits to the Emergency Room and hospital admissions for SARS-CoV-2

**Objectives:** The COVID-19 pandemic continues to place a large burden to rural hospitals, posing an ongoing need for effective interventions to mitigate the influx of emergency department visits and inpatient admissions. With the advent of targeted monoclonal antibodies in late 2020, there may be opportunity to prevent hospital admissions and return visits to the emergency department after the first contact with a COVID positive patient. Further investigation is warranted to measure the ability of monoclonal antibodies to reduce hospital burden of COVID-19 patients.

**Methods:** A retrospective review was conducted from September 2021 to February 2022 for patients who had a positive COVID-19 nasal swab test at their first visit to the emergency department. Outcome results defined as need for return visits to the emergency department and/or inpatient admissions following the initial emergency department screening and diagnosis of COVID pneumonia was collected for the control (did not receive monoclonal antibodies) and intervention (received monoclonal antibodies) groups. Data was not collected for non-COVID-specific treatments such as azithromycin and corticosteroids.

**Results:** The rate of return visits to the emergency room and hospital admissions was reduced for patients who received monoclonal antibodies following COVID pneumonia diagnosis at the first visit to the emergency department. Variable efficacy of treatments against emerging strains of the SARS-CoV-2 virus may have impacted outcomes for patients who received monoclonal antibodies that were not effective against predominant strains at time of diagnosis. Of the 15 patients in the monoclonal antibody group, no patients required inpatient admission, and 1 patient had a return visit to the emergency department (6.7% of intervention group). This return visit occurred the day after receiving casirivimab/imdevimab, when local cases were entirely comprised of the Omicron variant. Of the 259 qualified patients who did not receive monoclonal antibodies, 34 (13.1% of control group) required inpatient admission for COVID pneumonia, and there were 34 (13.1% of control group) return visits to the emergency department that did not require admission.

**Conclusions:** Administration of FDA recommended monoclonal antibodies at time of COVID-19 diagnosis in the emergency department may reduce hospital burden of inpatient admissions and hospital admissions for SARS-CoV-2.
Monoclonal antibodies may reduce return visits to the Emergency Room and hospital admissions for SARS-CoV-2 multiple emergency department visits. This is especially impactful in a rural hospital setting with limited access to care and resources. Further studies investigating specific variants and the effective monoclonal antibodies against them is warranted.
Authors: V. Nguyen, J. Mighty, L. Wachter; The Johns Hopkins Hospital (JHH), Baltimore, Maryland M. Gerstenhaber, S. Murli, H. Smith; The Johns Hopkins University School of Medicine, Baltimore, Maryland

Title: Optimization of Regulatory Compliance and Drug Distribution Practices within a Clinical Research Network

Objectives: The Johns Hopkins Clinical Research Network (JHCRN) connects Johns Hopkins Medicine (JHM) with regional community health care providers to promote multi-site clinical research. The Johns Hopkins Hospital (JHH) is one of several hospitals within Johns Hopkins Medicine. While each JHCRN site manages its own investigational drugs, the JHH Investigational Drug Service (IDS) pharmacy provides support and oversight of regulatory compliance to the JHCRN sites. There is a need to analyze current services provided by JHH IDS and identify service gaps to improve current practices and to support expansion of clinical trial services. The objective of this project is to provide recommendations to optimize pharmacy operations within the JHCRN, to increase regulatory compliance, and to meet the expected growth and expansion of clinical trial research.

Methods: An outline of the current JHCRN structure and model was created based on internal documents and discussion with JHCRN sites and staff. Metrics for JHCRN trial volume and characteristics from July 2021 to present day were collected and tabulated. Interviews were conducted with peer clinical research networks that were identified through search engine queries and selected based on the following criteria: inclusion of member sites outside the lead institution, partnership between academic and community organizations, and multiple network members. Summary of interview findings will be compared to the current JHCRN model to determine opportunities for improving pharmacy operations within the JHCRN.

Results: Findings from interviews with peer clinical research networks and service gap analysis will be presented. Final recommendations based on these results will be reviewed.

Conclusions: The project will describe the JHCRN current pharmacy model and trial metrics, summarize findings from interviews with peer clinical research networks, and provide results from a service gap analysis. The project will provide recommendations for improving pharmacy operations within the JHCRN based on analysis results.
Clinical and economic impact of surgical pharmacist implementation at a community hospital

**Authors:** Elizabeth Calderone, PharmD, Shannon Burke, PharmD, BCPS

**Title:** Clinical and economic impact of surgical pharmacist implementation at a community hospital

**Objectives:** Many medical centers across the country have implemented pharmacists into the OR and have seen a significant positive impact. It has been proven that the direct interaction between the pharmacist and the surgical team can lead to better outcomes and more adequately meet Surgical Care Improvement Project (SCIP) measures. The initial purpose of this research was to determine the impact a surgical pharmacist would have on both patient outcomes and pharmacy economics. However, during the preliminary investigational phase, it was determined that the need for full pharmacy presence in the surgical area was not as imperative as initially believed. We then determined that the implementation of process improvements would be more efficacious at Shore Medical Center.

**Methods:** This single-center study was submitted to the Pharmacy and Therapeutics Committee for approval. We evaluated the impact of improvements made to the pre-operative and post-operative process on hospital outcomes. This project analyzed the accuracy of pre-operative antibiotic regimens, the frequency of opioid prescribing at discharge, and overall improvement to the surgical pain protocol. A significant endpoint of this research has been the impact pharmacists have made on the pre-operative antibiotic order entry process. This process was observed for effectiveness and overall benefit to the hospital. The pain medications patients have been discharged on following surgery, specifically opioid medications, have been analyzed with the goal of decreasing opioid use in surgical patients. The surgical pain protocol has also been reviewed for any potential non-opioid additions in an effort to decrease opioid usage.

**Results:** Since beginning this research, several process improvements have been implemented throughout the hospital. The process of pre-operative antibiotic order review and entry by the pharmacy was determined to be effective and beneficial to the hospital. Pharmacists have consistently caught prescribing errors, interactions, and allergy issues among the orders they have received. Due to these results, this process will continue to be pharmacy-driven at SMC. The number of patients discharged on opioid pain medications following a surgery will continue to be observed as a part of the hospital-wide effort to decrease opioid prescribing. In the future, a plan will be implemented to prevent over-prescribing of opioids in all areas of the hospital.
Additional areas of improvement include hospital spending and overuse of costly medications. This will be further investigated in the future through use of Drug Use Evaluations such as the sugammadex evaluation that is currently in motion. Changes that have already been implemented include changes to the intra-abdominal antibiotic regimen to increase accuracy as well as the addition of non-opioid medications to the surgical pain protocol.

**Conclusions:** Through this research, several process improvements have been able to be implemented despite the inability to continue with the initial research plan for a surgical pharmacist position. Process improvements including changes to antibiotic and pain protocols are currently being used hospital-wide. The pharmacist involvement in pre-operative antibiotic order entry has been validated and will continue in the future. Several smaller projects have developed since the start of this research. Projects include decreasing hospital-wide opioid usage which will also reach the surgical patients. The spending in the surgical area will continue to be evaluated and eventually changes will be made according to the findings. Overall, this research has had a significant impact on the hospital through the process improvements that have been made and the many evaluations that will be continued in the future.
Conference Abstracts  
May 16-18, 2022

**Presenter Name:** Calderone, Elizabeth  
**Organization:** Shore Medical Center  
**Category:** Leadership/Management/Admin  
**Day | Session | Room | Time:** Wednesday | 6 | Empire D | 3:00:00 PM

**Authors:** Elizabeth Calderone, PharmD, Shannon Burke, PharmD, BCPS  
**Title:** Clinical and economic impact of surgical pharmacist implementation at a community hospital

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Additional areas of improvement include hospital spending and overuse of costly medications. This will be further investigated in the future through use of Drug Use Evaluations such as the sugammadex evaluation that is currently in motion. Changes that have already been implemented include changes to the intra-abdominal antibiotic regimen to increase accuracy as well as the addition of non-opioid medications to the surgical pain protocol.

**Conclusions:** Through this research, several process improvements have been able to be implemented despite the inability to continue with the initial research plan for a surgical pharmacist position. Process improvements including changes to antibiotic and pain protocols are currently being used hospital-wide. The pharmacist involvement in pre-operative antibiotic order entry has been validated and will continue in the future. Several smaller projects have developed since the start of this research. Projects include decreasing hospital-wide opioid usage which will also reach the surgical patients. The spending in the surgical area will continue to be evaluated and eventually changes will be made according to the findings. Overall, this research has had a significant impact on the hospital through the process improvements that have been made and the many evaluations that will be continued in the future.
Impact of SKU reduction for cost reduction and space optimization

An enterprise's formulary contains a list of approved medications and organizational guidelines on the utilization and conversion to these approved products. Formulary management is vital in optimizing patient care by ensuring access to clinically appropriate, safe, and cost-effective medications. The constant review and updating of a formulary help to ensure that patient care is optimized, while also minimizing medication spending and pharmaceutical costs. The first step in proper formulary management is to assess the currently approved medications in order to identify current prescribing trends and alternatives so that the formulary can be adjusted for cost and inventory reduction.

Methods: A list of the enterprise's current formulary medications was reviewed. This information was cross-referenced with purchasing and waste data from the year prior to identify medications or dosage forms that were no longer utilized or that had a therapeutic alternative that could be used instead. After identification of possible formulary removals, the proposed changes were brought to their respective committees for approval; this included Formulary & Therapeutics (F&T) subcommittees as well as enterprise level F&T.

Results: From this intervention we expect to decrease our current formulary size and by extension the current inventory stock on hand within the pharmacy department. This formulary and stock reduction should result in significant space requirement reductions, as well as cost savings via expired medication waste reduction.

Conclusions: The impact of this project will be felt throughout our institution and pharmacy department as both a space and cost saving measure. The reduction in inventory will allow for better management of the medications on hand, while the waste reduction from unused medications will be quantifiable as a one-time saving effort.
Premixed versus compounded intravenous antibiotics: Cost comparison at a community hospital

**Objectives:** The primary objective of this research was to investigate and compare total costs associated with purchase and preparation of premixed (PM) intravenous (IV) antibiotics versus manually compounded (MC) IV antibiotics. The initial cost of purchasing PM IV antibiotics is usually higher than purchasing IV solution for injection vials. Use of IV solution for injection vials requires additional staff, time, and supplies for pharmacy compounding, which have all been impacted in the setting of COVID-19.

**Methods:** This cost comparison analysis was conducted at Rutland Regional Medical Center, a 144-bed community hospital, and incorporates an observational study of pharmacists and technicians. Drug purchasing and compounding supply costs for PM formulations of piperacillin/tazobactam, cefazolin, cefepime, ceftriaxone, vancomycin, IV solution vials, diluents and supplies were obtained from RRMC’s pharmacy and distribution departments. To determine cost of preparation/verification, average time for 3 technicians and 3 pharmacists to complete tasks was obtained for each medication. For MC products, time was recorded for the following: gathering supplies, compounding in a sterile hood and assigning the product to a patient. The pharmacist was timed during verification after preparation and verification after product assignment. For PM products, time for the technician to assign the product and time for the pharmacist to verify it was recorded. Times for each step were averaged, then converted into monetary value based on average hourly pay for each position. Total cost of MC antibiotics was compared to the total cost of PM antibiotics. This research was approved by the institutional review board.

**Results:** Preliminary results show that total costs of PM products are higher than MC products for piperacillin/tazobactam, cefazolin, and ceftriaxone. The total costs of each product are as follows: piperacillin/tazobactam ($24.91 PM vs $24.43 MC), cefepime ($20.98 PM vs $24.93 MC), cefazolin ($13.39 PM vs $7.54 MC) ceftriaxone ($20.82 PM vs $9.71 MC) and vancomycin ($34.04 PM vs $76.25 MC). Notably, the cost of PM ceftriaxone was found to be almost double the cost of a MC product. Final results will be analyzed and presented.

**Conclusions:** The final results of this project will be utilized to support and develop recommendations for purchasing IV antibiotics at this institution.
Simplification of Ostomy Supplies at VA Hudson Valley Healthcare System

Objective: The ordering of ostomy supplies can be challenging for providers and pharmacists at VA Hudson Valley Healthcare System. Providers often have trouble locating the intended product due to the large amount of products available in the local drug file. Additionally, many ostomy products are not on the VA national formulary and require a non-formulary request or prior authorization. The amount of ostomy products in the local drug file causes Pharmacists to struggle to find the requested product when reviewing non-formulary requests. These issues often delay the non-formulary approval process and create a barrier to patient care. The goals of this project were to simplify our local drug file by reducing the number of products in the drug file and to streamline the ordering process to benefit providers, pharmacists, and patients. Additionally, we sought to implement a new standard process to ensure that our local drug file stays up to date.

Methods: Products falling in VA drug class XA400 through XA699, which are classified as ostomy supplies, were pulled from the local drug file for review. For products that are not fulfilled by our Consolidated Mail Outpatient Pharmacy (CMOP), a query was run to see if each product had been filled between 2/18/2021 and 2/18/2022. Products not filled within that time were inactivated and moved out of the drug file. Then an ordering menu was designed to help simplify the prescribing process. Products were initially separated by type, such as barriers, bags, catheters, pouches, wafers, and miscellaneous. Then, the products were placed into subcategories as applicable, such as separating by manufacturer name or type of bag or pouch. A process to ensure the supplies in our local drug file are kept up to date is in development.

Results: 135 ostomy products were identified as not being filled within the specified date range. These products were inactivated from the local drug file. 2 additional products were identified to be coded incorrectly as an ostomy supply instead of a dietary supplement which was corrected. Implementation of the ordering menu and a process to ensure the local drug file stays up to date are ongoing at the time of abstract submission. Feedback from providers and pharmacists will be collected after implementation.

Conclusions: Conclusions will provided upon project completion.
Conference Abstracts
May 16-18, 2022

**Presenter Name:** Jeong, Min Sun  
**Organization:** Qualitas Pharmacy Services  
**Category:** Leadership/Management/Admin  
**Day | Session | Room | Time:** Wednesday | 6 | Empire D | 3:30:00 PM

**Authors:** Min Sun (Minny) Jeong, PharmD  
**Title:** Leveraging a central warehouse for adult crash cart medication tray refills and distribution in a large integrated delivery network (IDN): a pilot study

**Objectives:** Currently, there is limited literature on the process of standardizing, refilling, and distributing medication trays within a large health system. In addition, a lack of an automated medication tracking system may lead to an increased number of expired medications in crash carts. There are various technologies available in the marketplace that may streamline the workflow and minimize waste of remote kits, such as medication trays in crash carts. RWJBarnabas Health is an IDN with acute care facilities, retail pharmacies, and Qualitas Pharmacy Services (QPS). The purpose of this research is to assess the current process for crash cart maintenance (restocking, locating, and inspecting) and to develop a procedure for medication tray refill and distribution through a central warehouse beginning with two pilot sites.

**Methods:** The QPS team worked with the acute care sites to assess the number of adult crash carts used across the IDN. Pharmacy leaders at each site were asked to determine the number of back-up trays needed to carry over between deliveries from the central warehouse. A rolling implementation strategy was established and two pilot sites were selected that were representative of the varied sized hospitals in the system. Preliminary data collection from January 2022 to March 2022 included the number of trays needed, the location of crash carts, and users in the two pilot sites. Drug inventory in the central warehouse was tracked on a bi-weekly basis and shortages were considered prior to implementation. Collaboration with the vendor took place to design the drug layout in the tray so the technology can be leveraged to confirm contents.

**Results:** It was determined that a total of 807 medication trays would be needed for twelve acute sites and an additional 100 back-up trays for the central warehouse. The drug inventory increased each week and was documented throughout the project. Once the trays are distributed to the pilot sites, the following metrics will be tracked: turnaround time from tray request from site to delivery, number of each medication used per site per month, number of expired medications, number of trays relocated to higher acuity areas per month, and of those, percent that expired before use.

**Conclusions:** Drug shortages of emergency syringes stalled the pilot project, but momentum is growing in Q2 of 2022. A system-wide approach will be employed to leverage a central
warehouse to standardize the adult crash cart medication tray refill and distribution process. Future longitudinal studies assessing the number of expired medications may provide insight on the benefit of standardization and automated medication tracking. Additionally, expansion to other kits used in the health system may be a potential target.
Nursing perceptions of pharmacy service: a self-assessment of nurses at a Veterans Affairs healthcare center

Objectives: Successful interprofessional relationships between medical professionals have been shown to improve patient outcomes and reduce overall healthcare costs. Interdisciplinary models have proven to be successful here at VA Connecticut Healthcare System (VACHS), however, understanding the contribution of other team members and communication remain a barrier to implementation. This project aims to evaluate the attitudes and opinions of VACHS nursing staff toward their interactions and collaborations with pharmacists, pharmacy technicians, and pharmacy leadership.

Methods: Inpatient nursing staff at VACHS, were asked to complete an informal voluntary self-assessment questionnaire targeting interactions and collaboration with pharmacy services. Three competency areas were assessed including values and ethics, teamwork, and communication. Participant demographics were also collected. Questions were developed in Likert scale format and included one open-ended question for participants to provide feedback.

Results: Responses were recorded and will be analyzed to identify common themes represented by this sample of inpatient nursing staff.

Conclusions: It is anticipated that the results of this questionnaire will identify target areas for future interventions to help foster more collaborative relationships between nursing and pharmacy staff members.
**Factors That Impact Pharmacy Technician Retention**

**Objective:** The national United States labor shortage is affecting many pharmacies throughout the country. Pharmacies across the nation are reporting difficulties filling open pharmacy technician positions. Pharmacy technician job satisfaction and retention has not been well studied. There are many factors that play into retention that could potentially be leading to lower retention. The purpose of this study was to investigate the factors that impact job satisfaction and retention of pharmacy technicians across various areas of pharmacy practice including but not limited to community (chain and Independent), hospital, and specialty.

**Methods:** An institutional review board approved survey was distributed to various virtual group messaging boards and pharmacies throughout the United States using a link or a scannable QR code. The questionnaire was used to survey current pharmacy technicians over the age of 18 who were registered with a state board of pharmacy. The survey was developed to ask demographic questions pertaining to state of employment, age, practice setting, hourly wage, number of years practicing as a pharmacy technician, and average number of hours worked per week. In addition to demographics there were several questions regarding satisfaction of current position, likeness of staying in current position and order of importance of different factors.

**Results:** A total of two hundred and ninety-five licensed pharmacy technicians from twenty-eight different states completed the survey. Sixty percent of all responses were from technicians who currently work in a hospital setting with the remaining percentages coming from those working in the settings of specialty, community, and others. Seventy-one percent of respondents reported that it was likely that they would stay at their current position for the next year. While only forty percent of respondents stated that it was likely that they would stay in their current position for the next three years. Compensation and advancement opportunities were rated the two highest options in terms of importance. Compensation, stress level, and advancement opportunities were the top three reasons selected for why a technician may leave their current place of employment.

**Conclusions:** The results of the survey indicated that compensation and work environment were ranked the most important to those technicians who were likely to stay within their current position. Although more research will be needed to further aid the future management choices.
made regarding pharmacy technicians, it is important to focus on keeping compensation competitive and maintaining a positive work environment. In future technician surveys it will be critical to include technicians who are not registered with a board of pharmacy in addition to collecting responses from technicians in wider variety of practice settings.
Author: Akshara Kumar, PharmD; Denise Fu, PharmD, BCACP; Robert Green, PharmD, BCGP; Rosalyn Stewart, MD, MS, MBA; Caitlin Dowd-Green, PharmD, MBA, BCPS, BCACP

Title: Exploration of a Medication Charitable Access Program for Uninsured and Uninsurable Patients

Objectives: Previous studies demonstrate that cost-related medication adherence is associated with poorer health outcomes and increased use of expensive avoidable healthcare services. Patients who are uninsurable are especially at risk for nonadherence due to high out-of-pocket costs for services. At Johns Hopkins Hospital (JHH), a charitable care program, The Access Partnership (TAP), supports clinical visits and hospital care for uninsurable patients but lacks an approach for medication access. In an effort to develop a TAP program formulary for these patients, the main objective of this study is to identify the most frequently prescribed medications and current medication acquisition methods among JHH TAP patients.

Methods: This is a multi-center, retrospective cohort study for adult patients over the age of 18 years old who are ineligible for private or public insurance programs and are enrolled in TAP. To be included, patients must have had at least one ambulatory encounter in an Internal Medicine Clinic on the East Baltimore Campus between 01/01/2019 to 06/30/2021. Information regarding clinic encounters and medication orders during this time frame will be collected via chart review and review of dispensing information from outpatient pharmacy databases. Clinic encounter information includes average number of encounters per patient, average number of medication orders per visit, and the frequency of emergency department visits or hospitalizations which occurred during the time frame. The outcomes of this study include identifying frequently prescribed medications, forms of medication assistance used to acquire medications, the overall cost spent on these medications, and the percentage of patients who fill at a Johns Hopkins Outpatient Pharmacy or other pharmacies. Descriptive statistics will be used.

Results: The most frequently prescribed medications, medication classes, and healthcare utilization information will be presented.

Conclusions: We anticipate that this will provide insight into medications to incorporate into a formulary that can be used to support medication access for TAP patients. Frequently prescribed medications for specific conditions will also be compared to current cost-effective treatment recommendations in select disease state guidelines, including diabetes mellitus, hypertension, and cardiovascular conditions. In addition, this data will create a baseline...
comparator to assess the effectiveness of implementing a medication access program in reducing preventable healthcare utilization.
Evaluation of pharmacist intervention documentation at a rural community hospital

Presenter Name: Le, Felicia  
Organization: Rutland Regional Medical Center, Rutland, VT  
Category: Leadership/Management/Admin  
Day | Session | Room | Time: Wednesday | 6 | Empire D | 4:00:00 PM

Authors: FT Le, LB Twarog, RS Kowalczyk, S Branchaud, EC Piehl

Title: Evaluation of pharmacist intervention documentation at a rural community hospital

Objectives: Healthcare organizations rely on clinical pharmacists to enhance patient care quality and promote a safer environment. Many institutions require pharmacists to document their clinical interventions, which allows for evaluation of types of interventions made, pharmacist workload, and impact on patient care. The objective of this study was to quantify and qualify the pharmacist role in patient care through the development and implementation of a new intervention documentation form.

Methods: Rutland Regional Medical Center is a 144-bed community hospital with a pharmacy department of 22 pharmacists. An electronic medical record (EMR) form was customized for pharmacist documentation of interventions during order verification and interdisciplinary rounding. A one-month limited pilot phase was conducted (September 19-October 22, 2021), followed by a four-month full rollout period (December 1, 2021- March 31, 2022). During the pilot phase, four clinical pharmacists utilized the form to document interventions performed through institutional pharmacy protocols (e.g. renal dose adjustment, therapeutic interchanges, etc.), non-protocolized interventions, and clinical recommendations. A data report was built from the EMR and the form was optimized for use by all pharmacists based on feedback obtained during the pilot phase. Quantitative data collected in the reports were evaluated to determine intervention characteristics: number, type, pharmacy protocol versus non-pharmacy protocol, number of unique patients impacted, time spent, and medications involved. This prospective cohort study was approved by the institutional review board.

Results: Preliminary results from September 19, 2021 through February 28, 2022 showed that an average of 505 interventions were documented on an average of 251 unique patients per month (733 interventions during the pilot phase and 1,288 during the implementation phase). Of those interventions, 559 (28%) were pharmacy protocols and 1,462 (72%) were not related to established pharmacy protocols. Most interventions had an estimated time spent of 0-5 minutes, with approximately 45 hours spent on documented interventions each month. The top intervention types documented were therapy recommendations, daily clinical documentation, patient counseling and renal dose adjustments. Interventions documented through March 31st will be recorded and final results will be presented.
Conclusions: The final results of this project will be utilized to demonstrate pharmacist workload, impact on patient care, opportunities for additional pharmacy protocols, and areas for process improvement at this institution.
Improving the Ordering Process for Wound Care Products at the VA Hudson Valley Health Care System

Objectives: Over-ordering wound care products or having difficulty finding the right product to order can lead to additional costs for the facility, delayed wound care, poor veteran satisfaction, and increase the work time for providers and pharmacists. At VAHVHCS, due to the extensive list of wound care products in the local drug file, the providers encounter many of these challenges. As a result, there were reported delays in patient wound care, potentially jeopardizing their healing process. Simplifying the ordering process by reducing the products in the local drug file, providing an organized ordering panel, and creating a product guide with descriptions can help reduce the time it takes to complete ordering wound care supplies and help providers to identify the correct product, thereby improving the care of veterans.

Methods: A total of 194 wound care products were identified from the local drug file, using a set of wound care supply terms, on 2/16/2022. To reduce the product list, products were deactivated from the drug file if they had not been filled in the past 12 months (2/1/2021-2/1/2022), identified using Structured Query Language, if they were not found in the product line on the Consolidated Mail Outpatient Pharmacy website and not filled in the past 12 months, or if there were duplicated product entries. The condensed supply list was used to create a product guide, including website links to product descriptions, and to create an organized ordering panel. A satisfaction survey was used to assess the providers’ satisfaction and to gather their concerns for ordering the supplies, before and after the product guide distribution.

Results: Data collection is ongoing

Conclusions: N/A
Impact of Pharmacist-Led Workflow Improvement of Adherence Monitoring on Community Pharmacy Star Ratings

Objectives: More research is needed to determine if there are any designs by which pharmacies can be more adequately reimbursed for direct and indirect remuneration (DIR) fees. Assessment is needed to determine the impact a pharmacist or pharmacy technician can have on pharmacy star measures and DIR fees. Pharmacists and pharmacy technicians are often the most accessible healthcare professionals that patients contact, and thus are uniquely able to help establish why patients may not be adherent to their medications. Pharmacists can assist patients having adherence issues as well as navigating different avenues of drug therapy management if patients are experiencing adverse effects or have a true allergy to a medication. This project will assess workflow improvement and cost evaluation to determine the value difference of pharmacist vs. technician intervention by keeping track of the amount of clinical judgment that is required during patient contact. This research aims to evaluate pharmacist/pharmacy technician influence on star measures and DIR fees to determine the value of dedicating pharmacy resources and personnel to contact these patients regularly in a community retail setting.

Methods: Potentially non-compliant patients are identified using data from pharmacy benefits management database. These patients are contacted by a pharmacist to discuss potential reasons for non-compliance. Upon identification of the reason for non-compliance, the pharmacist offers counseling for maintaining compliance to their medication regimen. The pharmacist may also offer the patient the use of tools such as medication sync, automatic refills, text message reminders, etc. so that patients may more easily manage their medication therapy. All interactions with patients will be tracked to measure the actions that are being taken. If clinical judgment or pharmacist-level counseling was offered, then pharmacist time will be tracked to measure value of services. Upon completion of data collection, the pharmacy’s star ratings will be compared to how they were before interventions began.

Results: The results will be recorded and presented. Preliminary data has shown pharmacist and pharmacy technicians can play a substantial role in helping patients become more adherent
to medications. Star measure data is reported one month behind, so these results will take more time.

**Conclusions:** N/A
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Results: The results will be recorded and presented. Preliminary data has shown pharmacist and pharmacy technicians can play a substantial role in helping patients become more adherent
to medications. Star measure data is reported one month behind, so these results will take more time.

Conclusions: N/A
Carousel transformation: Applying a systematic approach to optimize medication safety and operational efficiency when upgrading existing automation.

Objectives: The purpose of the study is to demonstrate improvements in medication safety and operational efficiency. This effort will occur as we upgrade automated pharmacy carousel system (APCS) within our department of pharmacy. We intend to demonstrate increased inventory turnover, decreased out of stock occurrences, and reduced medication dispensing errors involving carousel technology.

Methods: This single-center, observational prospective study will analyze changes in on-hand inventory values and annual purchasing between September 2021 and March 2022. All medications managed by our central pharmacy carousel software will be included and medication utilization reports will be analyzed weekly to adjust pars and maximum quantities for optimal inventory. Medication bin locations will be distinguished appropriately according to ISMP’s recommendation for handling of high-alert and look-alike sound-alike medications and staff will be educated on carousel technology to decrease medication errors and mispicks.

Results: The primary outcomes of this study will be the reduction in stock outs and difference in inventory turnover pre- and post-carousel implementation. The secondary outcome will be a reduction in reported medication errors involving the use of carousel technology.

Conclusions: Many institutions can benefit by taking a systematic approach to optimize their carousel technology. Medication safety and operational efficiency can be improved by distinguishing bin locations, analyzing medication utilization, and educating staff appropriately.
**Presenter Name:** Weng, Roy  
**Organization:** The Johns Hopkins Hospital  
**Category:** Leadership/Management/Admin  
**Day | Session | Room | Time:** Tuesday | 3 | Magnolia D | 12:15:00 PM

**Authors:** R Weng, D Rodriguez; The Johns Hopkins Hospital (JHH), Baltimore, Maryland

**Title:** Cost benefit analysis and impact of a web-based quality management documentation system for pharmacies within a health system.

**Objectives:** Current documentation practices for sterile and nonsterile compounding regulation compliance across the Johns Hopkins Health System (JHHS) are fragmented, labor intensive, and time consuming. Administration must access and assess many non-harmonized sources of data to determine compliance with USP <795>, <797>, and <800> regulations. The current market offers solutions for hospitals to centralize and automate compliance. The web-based solutions will be compared to the development of an in-house documentation system. The objective of this evaluation is to identify the most cost-effective solution best suited for the health system's unique needs to comply with regulatory requirements, mitigate risk, and ensure patient safety.

**Methods:** This analysis is comprised of four stages: understanding of current Johns Hopkins Health System USP documentation practices, evaluation of current market solutions for USP documentation, assessment of developing a homegrown system, and completion of a cost-benefit analysis. Custom rubrics will be created to facilitate JHHS stakeholder feedback and commentary toward vendor request for information responses and vendor references. A SWOT analysis will be performed to evaluate product costs, documentation capabilities, real-time data management, reporting capabilities, system maintenance requirements, and system user experience.

**Results:** The USP documentation system will be determined by the results of the SWOT analysis and cost of the most compatible vendors.

**Conclusions:** It is anticipated that this project will identify the best solution for an optimized documentation system across the health system that can create quality assurance to assist in maintaining an environmental state of control within the department of pharmacy.
Presenter Name: Blake, Caitlyn  
Organization: ChristianaCare Health System; Newark, Delaware  
Category: Medication Safety  
Day | Session | Room | Time: Monday | 1 | Magnolia C | 1:45:00 PM

Authors: C. Blake, S. Lasota, J. Batman, M. Culbert, S. May  
Title: Insulin prescribing errors at transitions of care and the impact on readmission rates  

Objectives: Management of diabetes includes not only lifestyle modifications, but also medications, many of which can be at high risk for associated error. Insulin, one of many agents that can be prescribed to patients to help manage diabetes, has increased rates of medication errors that can result from incorrect administration technique, incorrect dose, and/or the failure to obtain correct diabetes testing supplies needed for administration. In 2017, the Institute for Safe Medication Practices released guidance on the optimization of safe subcutaneous insulin use in adults which emphasized the importance of transitions of care. One recommendation is to have a process in place to ensure patients have the necessary prescriptions, supplies, and instructions upon discharge. The primary outcome of this study is the characterization of errors at discharge for insulin and associated orders.

Methods: This study is a retrospective cohort design which seeks to evaluate patients aged 18 years or older discharged from the emergency department or an inpatient admission with a new prescription for insulin from January 1, 2019-June 30, 2021. Patients were excluded if insulin was prescribed prior to arrival or discharge disposition was to another healthcare facility. An error at discharge is defined as missing co-prescription for insulin pen needles, insulin syringes, testing supplies (glucometer, testing strips and lancets), or patient prescribed sliding scale insulin without the scale included. Descriptive statistics were used to define the characterization of errors.

Results: Among the 200 patients discharged with new prescriptions for insulin, mean age was 56 years, 60% were male, 48% were white and 81% had prescription insurance. Most patients were discharged with insulin pens (77%). However, only 53% of patients discharged with insulin pens had a prescription for pen needles and 20% of patients discharged with insulin vials had a prescription for insulin syringes. Patients had appropriate testing supplies (glucometer, lancets, and testing strips) prescribed together 53% of the time. Overall, 22.5% of eligible patients were prescribed sliding scale insulin, of which 42.6% of patients prescribed prandial insulin were discharged on a sliding scale regimen. These patients had missing or incomplete directions 47% of the time. Secondary outcome results will be presented.
Conclusions: It is anticipated that these results will highlight an area for improvement in the discharge process for patients newly started on insulin and lead to future quality improvement projects.
Title: Evaluating hypoglycemic events in a critical care insulin infusion protocol compared to basal-bolus insulin regimen

Objectives: The 2021 American Diabetes Association guidelines recommend initiating hyperglycemia treatment in patients with blood glucose (BG) level >180mg/dL and treating to a target BG range of 140-180 mg/dL in most hospitalized patients. In the critical care setting, hyperglycemia is to be treated with continuous intravenous (IV) insulin infusions to be adjusted based on frequent BG monitoring. The objective of this study is to compare the incidence of hypoglycemic episodes in patients who received the critical care medicine (CCM) insulin infusion protocol to those who received basal-bolus (BB) insulin regimens in a critical care setting.

Methods: This is a retrospective, single-center, observational electronic medical record review evaluating adult patients (≥18 years old) admitted to Geisinger Medical Center's intensive care units between 09/01/2018 and 08/31/2021. This study will evaluate hypoglycemic events (defined as blood glucose <70 mg/dL) in patients on Geisinger's CCM insulin protocol as compared to patients on a BB insulin regimen (ie. insulin glargine plus insulin aspart) using a chi-square test. Subgroup analyses will be performed to evaluate the use of a BB insulin regimen pre-COVID (defined as any time during or before February 2020) and post-COVID (defined as any time during or after March 2020), the incidence of severe hypoglycemia (defined as blood glucose <40mg/dL), and the administration of drugs that may alter blood glucose.

Results: A total of 229 patients were included in the final analysis. The CCM insulin infusion was administered to 139 patients; the BB regimen was administered to 89 patients. The median ages were 64 years in the CCM infusion group and 68 years in the BB group. Each group consisted of approximately 40% female patients. A prior diagnosis of diabetes was identified in 67% of patients. There was a total of 44 (19%) hypoglycemic events that occurred. Of these, 16 (36%) occurred in the BB group and 28 (64%) occurred in the CCM insulin infusion group (OR 0.87, p-value 0.69). Of the patients that experienced a hypoglycemic event, 12 (27%) were on medications that could potentially lower serum glucose levels, and 39 (87%) were on medications that could potentially increase serum glucose levels. Severe hypoglycemic events occurred in 4 (4%) patients in the BB insulin regimen group and in 5 (3%) patients in the CCM insulin infusion group, (OR 1.26, p-value 0.73). The BB insulin regimen was administered in 42
patients pre-COVID and in 47 patients post-COVID. The median length of stay was 10 days and 8 days in the CCM infusion group and BB regimen group, respectively.

**Conclusions:** In critically ill patients, a basal-bolus insulin regimen was not associated with significantly more hypoglycemic events versus a critical care insulin infusion.
**Presenter Name:** Fazio, Victoria  
**Organization:** JFK Medical Center  
**Category:** Medication Safety  
**Day | Session | Room | Time:** Monday | 1 | Magnolia C | 12:30:00 PM

**Authors:** Victoria Fazio, PharmD, Jerry Altshuler, PharmD, BCPS, BCCCP and Yong-Bum Song, PharmD, BCPS, BCCCP

**Title:** Safety and feasibility of opening tamsulosin capsules for enteral feeding tube administration

**Objectives:** Tamsulosin is formulated as sustained release beads within a capsule, to prevent rapid absorption and associated hypotensive effects. The package insert advises the capsule be swallowed whole; not crushed, chewed or opened. Two pediatric studies, Tasian et al. and Tsuda et al., investigated tamsulosin for various indications in children. In both studies, children who could not swallow capsules were administered the drug sprinkled into a drink, yogurt or pudding. No adverse side effects were noted with the tamsulosin group, including those who received the medication via open capsules. Additionally, there were no major differences in pharmacokinetics among pediatrics and adults, even though some pediatric patients were administered open tamsulosin capsules. This data suggests the safe use of open tamsulosin capsules, however there is no current data on opening tamsulosin capsules in adults with enteral tube feeds. The goal of this research is to examine the feasibility and safety of administering tamsulosin capsule content via enteral feeding tube.

**Methods:** A single center retrospective chart review was conducted throughout two Hackensack Meridian Health network sites from January 1st 2021 to December 31st, 2021. All adult patients ordered tamsulosin or doxazosin were included if they received at least one dose while they had an enteral feeding tube in place and the route of administration was recorded as such. Demographics and data collected included patient age, gender, weight, number of antihypertensive medications administered, hemodynamics (blood pressure), indication for tamsulosin or doxazosin use, type of tube (including placement and diameter) and number of documented tube clots. The outcomes to be evaluated are the number of documented tube clots and incidence of tamsulosin associated hypotension, as compared to doxazosin.

**Results:** The primary outcomes, including the number of tube clogs among treatment groups and the incidence of tamsulosin or doxazosin associated hypotension, will be recorded and results will be presented.

**Conclusions:** It is anticipated that this study will demonstrate the safety and practicality of opening tamsulosin capsules for enteral feeding tube administration and demonstrate a role for protocol-driven administration as such.
Conference Abstracts
May 16-18, 2022

Presenter Name: Greenwood, Naomi
Organization: MaineGeneral Medical Center
Category: Medication Safety
Day | Session | Room | Time: Monday | 1 | Magnolia C | 1:15:00 PM

Authors: Naomi Greenwood, PharmD; Rachael Elias, PharmD; Ellie Provisor, PharmD

Title: Creating a pharmacist-driven nasal naloxone take-home kit protocol for a rural community hospital

Objectives: The number of opioids prescribed for the management of acute and chronic pain has significantly increased, resulting in an increase in opioid overdoses worldwide. Nasal naloxone take-home kits are dispensed mainly to patients with a history of substance abuse or recent overdose, creating missed opportunities for other high risk patients. The objective of this study is to create a protocol for pharmacy to improve access to intranasal naloxone take-home kits.

Methods: A standing order was developed in collaboration with pharmacy, providers, nursing and the Harm Reduction Program to allow pharmacists to prescribe and dispense nasal naloxone take-home kits to eligible patients. The standing order will work in conjunction with a pharmacy protocol that was developed to help identify at risk patients. Included patients have a history of opioid use disorder, receive a buprenorphine-containing product, naltrexone or methadone, a long acting-opioid, concurrent opioid and benzodiazepine, and elderly patients greater than 65 years old receiving an opioid. Patients are screened at medication reconciliation and pharmacists prescribe a nasal naloxone take-home kit to the qualifying patient. Pharmacists and/or nurses educate the at-risk patient on overdose risk and the use of naloxone before discharge and the kit is dispensed.

Results: The pharmacy protocol will be implemented and both the standing order and protocol will be presented.

Conclusions: It is anticipated that implementing a pharmacist-driven nasal naloxone take-home kit protocol will increase patient's accessibility to naloxone at hospital discharge.
Impact of a health system implemented dosing methodology on appropriate prescribing of direct oral anticoagulants

Objectives: In order to optimize and facilitate appropriate administration of high-risk medications, many institutions utilize dosing methodologies to standardize computerized physician order entry. For direct oral anticoagulants (DOACs), it is paramount that the appropriate dose is initiated and continued to decrease the risk of adverse events such as bleeding and thrombosis. This study aims to evaluate the impact of our health system implemented dosing methodology on the prescribing of DOACs.

Methods: This was an institutional review board approved, single-center, retrospective chart review that compared admitted patients on DOACs ordered with the adult dosing methodology against patients with DOAC orders prior to methodology implementation. Primary outcomes included the incidence of appropriate initiation and continuation of DOACs as defined by dose and indication, and the incidence of pharmacist intervention for correct dosing of DOACs. For primary outcomes, Fisher’s Exact test was used to test association between categorical variables and both patient groups. For numerical variables, Wilcoxon Mann Whitney test was used to compare distributions in the control and intervention groups.

Results: A total of 200 patients were included in the study. There was no difference in inappropriate prescribing between the two groups (22% vs. 22%, p=1). When the primary outcome was adjusted for inappropriate orders with a total methodology override, inappropriate prescribing decreased to 9%, leading to a 13% decrease after methodology implementation (22% vs. 9%, p<0.0268). Incidence of pharmacist intervention decreased after implementation of the dosing methodology (10% vs. 8%, p<0.81), with fewer dosing-related interventions recorded.

Conclusions: This study found a statistically significant decrease in inappropriate ordering after implementation of a dosing methodology when excluding inappropriate orders with total methodology override. The reasons for provider override were unclear due to the retrospective nature of this study. A small sample size may have prevented true assessment of pharmacist intervention. Further studies with a larger sample size are needed to assess the true impact of a dosing methodology and to account for adverse events.
Comparison of drug interactions identified by three software in medically complex older adults

**Authors:** Jessop J, Bankes D, Sreeram A, Bardolia C, Turgeon J, Amin N

**Title:** Comparison of drug interactions identified by three software in medically complex older adults

**Objectives:** To quantify variations in clinically relevant drug-drug interactions (DDIs) identified between Lexicomp® (LC), Micromedex® (MM), and MedWise® (MW) in medically complex older adults with polypharmacy.

**Methods:** Across four Programs of All-Inclusive Care for the Elderly (PACE), we retrospectively evaluated DDIs detected for patients taking ≥5 medications. Clinically relevant was defined as a severity alert rating that met or exceeded Moderate for MM and C for LC. For MW, we used critical pharmacodynamic (PD) and pharmacokinetic (PK) thresholds in the absence of severity alert ratings. We compared each software by the number of DDIs/patient; interrater reliability (Fleiss kappa); and percent agreement. Sub-analyses evaluated differences by mechanism of action.

**Results:** At interim, 3,255 unique drug pairs were evaluated from 77 PACE patients (aged 75.2 ± 10.6 years, 76.6% female). This resulted in 797 unique DDIs identified across the software. Compared to LC and MM, MW identified significantly more DDIs/patient (MW: 9 [IQR: 3, 18] vs. LC: 7 [IQR: 3,13], p = 0.021; MM: 5 [IQR 2,9], p <0.001), where PK-DDIs were largely responsible for this increase (MW: 4 [IQR: 1, 9] vs. LC: 1 [IQR 0,3], p <0.001; MM: 1 [IQR 0,3], p <0.001). Across all software, interrater agreement was moderate (kappa = 0.43). Surprisingly, on a pairwise basis, LC-MM agreement was moderate (kappa = 0.57). Of the DDIs (n=797), complete agreement was observed for 19.2% (n=153), whereas 29.6% (n=236), 18.7% (n=149), and 6.4% (n=51) were uniquely identified by MW, LC, and MM, respectively. Moreover, MW, LC, and MM uniquely identified 61.8% (n=218), 11.3% (n=40), and 7.1% (n=25) of PK-DDIs (n=353), respectively.

**Conclusions:** MW identified more unique drug interactions than LC and MM, with PK-DDIs accounting for a large proportion of these unique interactions. Thus, differences observed between software were attributable to MW's propensity to detect unique PK-DDIs via a no alert, multi-drug visualization. This strategy may help reduce alert fatigue and enhance a clinician's ability to optimize drug regimens efficiently.
Conference Abstracts
May 16-18, 2022

Presenter Name: Khieu, Tiffany
Organization: Jersey City Medical Center
Category: Medication Safety
Day | Session | Room | Time: Wednesday | 5 | Magnolia D | 1:45:00 PM

Authors: T. Khieu, S. Plotkin, S. Moreau, M. DeVivo; Jersey City Medical Center, New Jersey

Title: Multimodal pharmacist intervention and education in substance use disorder withdrawals

Objectives: Opioid use disorder (OUD) and alcohol use disorder (AUD) are commonly encountered in an inpatient setting, complicated by their respective or concomitant withdrawals. Available literature and institution internal data revealed inadequate medication management due to lack of experience and knowledge in medications used to manage acute withdrawals. Hence, the objective of this study is to reduce medication errors by pharmacy education and prospective drug utilization review requirements and documentation. Additionally, we sought to explore the pharmacist role in comorbid OUD and AUD management.

Methods: This is a single-center quality improvement study comprised of two parts. In part one, the resident developed a pharmacy education tool and implemented prospective drug utilization review requirements for pharmacists. The withdrawal medications of interest includes methadone, buprenorphine, lorazepam, and diazepam. Additionally, pharmacist knowledge was assessed by pre- and post-testing. The primary endpoint is the incidence of medication errors for each medication comparing pre- and post-intervention data. The secondary endpoint will be pre-and post-test scores. In part 2, the pharmacy resident prospectively assessed patients meeting criteria in a 3-month period. These criteria include adult patients admitted to general medical floors with documented and/or history of OUD, AUD, or comorbid diagnosis. Glasgow coma scale score of less than 8, intubated, intensive critical unit, and emergency department patients were excluded. Data to be collected for part 2 of the project includes number of accepted pharmacy interventions and addition of adjunctive medications. Descriptive statistics, t-test, and chi square test will be utilized to analyze study endpoints.

Results: Data collection and analysis is ongoing and final results will be presented. In the pharmacist knowledge assessment (n=21), the average test scores are 75.3% and 88.2% for the pre- and post-intervention groups, respectively. We expect to see a reduction of medication errors post-intervention by increased prospective drug utilization review and documentation performed by pharmacists.

Conclusions: It is anticipated that the implementation of prospective drug utilization review requirements for pharmacists for substance use withdrawals management will improve appropriate use and reduce medication errors. Conclusions are pending.
Author Name: Leonard, Joy
Organization: Sibley Memorial Hospital - Johns Hopkins Medicine
Category: Medication Safety
Day | Session | Room | Time: Monday | 1 | Magnolia C | 12:15:00 PM

Authors: J. Leonard, M. Goldenhorn, C. Keeys, S. Ali; Sibley Memorial Hospital â€“ Johns Hopkins Medicine, Washington, DC

Title: Enhancing pharmacovigilance methodologies in infusion center oncology patients

Objectives: The purpose of this research is to test an enhanced method for capturing, reporting, and analyzing suspected adverse drug reaction (ADR) data as a means of identifying opportunities for improvement.

Methods: A query was tested for collecting data within the electronic health record of patients on chemotherapy/biological agents with treatment adjustments (treatment note modifications) from January 1, 2020 to December 31, 2020. A sample of this query was then reviewed by the research team to validate patients met the following inclusion criteria: 1) active Sibley Infusion Center patients, 2) orders for a chemotherapy/biological agent, and 3) treatment note modifications due to a suspected ADR. If a modification was made due to a suspected ADR, additional analysis of the data was done to quantify and characterize the ADR into a standardized report for comparison with methods historically used within the institution.

Results: 331 treatment note modifications met inclusion criteria one and two. A random sample of 88 (26.6%) entries were reviewed by the research team to identify suspected ADRs. Of the 88 entries reviewed, 20 (22.7%) entries were categorized as suspected ADRs. These were classified by predictability, severity, causality, and patient outcomes. Nineteen ADRs were categorized as predictable, while 1 was categorized as unpredictable. One ADR was mild and 19 were moderate. Of the 20 ADRs, 1 was highly probable, 13 were probable, 5 were possible, and 1 was remote in causality. Sixteen of the 20 patients had resolution of ADR symptoms. Two patients did not have symptom resolution, and 2 patients expired. The most frequent chemotherapy/biological agents that were associated with causing the ADR were paclitaxel (25%), gemcitabine (20%), and oxaliplatin (15%). The most frequent ADRs reported were neuropathy (40%), nausea (15%), and rash (10%). The most common terms (n) observed in the treatment note modifications associated with ADRs were reduction (6), omission (5), and decrease (3). The areas of opportunities for improvement will be identified and the results will be presented.

Conclusions: It is anticipated this project will serve as a foundational point to compare the utility of the query tested to the current method of ADR reporting. It is also expected that...
opportunities for improvement in capturing, reporting, and analyzing ADRs will be outlined so that future research can build upon these findings.
Pharmacist consult service in patients with acute hospitalization greater than 30 days

Objectives: The average hospitalized patient is subject to at least one medication error per day, according to the Institute of Medicine's Preventing Medication Errors report. In long term care facilities (LTCFs), Centers for Medicare and Medicaid Services (CMS) requires a monthly drug regimen review by a licensed pharmacist. The purpose of this study was to identify the significance of implementing a pharmacist-driven, medication review service in patients hospitalized greater than 30 days at a tertiary community teaching hospital.

Methods: Participants included patients greater than 18 years of age hospitalized greater than 30 days from November 2021 to April 2022. Participants were excluded if they were in the intensive care unit, on hospice, or anticipated mortality was less than two days on day 30 of admission. A pharmacist-led, inpatient, drug regimen review protocol was developed based on the current CMS standards for LTCF patients. The pharmacist monitored patients for eligibility at least twice a week and a comprehensive review of medications and patients' charts was conducted between day 28 and 32 of admission. All pharmacist interventions required provider approval. Pre-implementation data from November 2020 to April 2021 was collected retrospectively via the EMR. The primary endpoint was the number of medication related events per patient. Secondary endpoints included type of pharmacist interventions, number of pharmacist interventions accepted, number of medication reviews performed, types of errors, length of stay, and discharge disposition. Chi Square test was used for categorical data, unpaired T-test was used for continuous data and baseline characteristics were analyzed using descriptive statistics.

Results: In the pre-implementation group, 54% of patients experienced medication related events. Five percent of patients were on unnecessary drugs in excessive dose, 26% were on drugs without adequate monitoring, 16% experienced adverse consequences and seven percent needed weight based medication adjustments. The average length of stay was 42.99 days. The number and percentage of medication related events, patient safety events and length of stay in the post-implementation group will be recorded and results will be presented.

Conclusions: It is anticipated that this project will demonstrate a significance of implementing a pharmacist driven medication review service in patients hospitalized greater than 30 days in
order to reduce the number of medication related events per patient and improve patient care overall.
Evaluation of medication exposure on exacerbation of disease in patients with myasthenia gravis

**Objectives:** In patients with myasthenia gravis (MG), acute worsening of myasthenic symptoms poses a risk of respiratory failure which can be precipitated by infections, surgery, and/or medications to name a few. The risk associated with administration of potentially harmful medications is not fully elucidated as available evidence examining manifestations of these drug-disease interactions is limited. A clinical decision support tool was implemented within our health-system to notify providers of the presence of an exacerbating medication being ordered for a patient with MG. We performed a large-scale exploration of potentially harmful medication exposure to determine the incidence of MG exacerbations.

**Methods:** This retrospective cohort evaluated adult patients with MG at 2 large academic medical centers between November-2019 and November-2021 who had received a medication included in the clinical decision support alerting tool. Administration events were excluded if (1) admitted diagnosis was an acute MG exacerbation unrelated to medication exposure, (2) the patient was stabilized on the interacting chronic medication at baseline prior to hospital admission and event represented continuation of home therapy, and/or (3) need for mechanical ventilation prior to administration. The primary outcome was exacerbation of disease, defined as a composite of escalation of respiratory support, treatment with IVIG or plasma exchange within 96 hours of the administration event, negative inspiratory force less than 20 cm H2O and/or vital capacity < 1L. The secondary outcome assessed changes in extremity motor strength following administration.

**Results:** 72 orders were assessed in 39 unique patients across 56 hospital encounters. Medications administered during these encounters included macrolide antibiotics, fluoroquinolones, beta-blockers, non-dihydropyridine calcium channel blockers, and IV magnesium sulfate. Exacerbation of disease occurred in 7 encounters (12.5%). All exacerbations were characterized by escalation of respiratory support and associated with magnesium or beta-blocker administration. In 5/7 exacerbating events, at least one MG crisis risk factor was present and in 3 of those events, multiple exacerbating medications were
administered. One patient met the primary endpoint in two separate admissions, both following IV magnesium use. Motor strength scores remained unchanged following administration.

**Conclusions:** High risk medications continue to be administered to patients with MG within our health-system. Beta blockers and IV magnesium were identified in our study as potential precipitants of an MG crisis. Increased caution is advised when considering common inpatient medications for MG patients and respiratory status should be closely monitored when potentially exacerbating medications are utilized.
**Title:** Safety of drugs with the potential to cause liver injury in a community hospital

**Objectives:** The liver is responsible for metabolizing the majority of medications which makes it susceptible to drug-induced injury. A broad range of drugs can be hepatotoxic and cause liver dysfunction, from mild inflammation to liver failure. Drug-induced liver injury (DILI) is the leading cause of acute liver failure, accounting for 13% of all cases. DILI registries report a death or liver transplantation rate of 10%. Depending on the duration of injury and location of damage, DILI can be described as acute or chronic and as hepatocellular, cholestatic, or mixed pattern of injury. The National Center for Toxicological Research has developed a Liver Toxicity Knowledge Base Benchmark Dataset that scores drugs based on DILI severity, the highest of which is eight. These drugs are often used in hospitalized patients for a variety of indications or are restarted from home. At our institution, most pharmacists have limited knowledge about DILI and interventions to make in these scenarios.

**Methods:** Adult patient electronic medical records admitted to the hospital and ordered any of a subset of DILI class eight drugs with the potential to cause DILI from January 3, 2022 to March 31, 2022 were reviewed concurrently. Interventions, including recommendations for discontinuation of offending drugs, were made prospectively. Data, including demographics, patient medication usage, hepatic function tests, length of stay, and discharge status, was collected and reviewed.

**Results:** The number of patients experiencing hepatotoxic effects, including their pattern of liver injury, will be collected and analyzed, and results will be presented.

**Conclusions:** This prospective study demonstrates a role for pharmacist-based patient assessment and intervention to improve safety of drugs that can cause liver injury.
Clinical pharmacist real-time review of discharge prescriptions: can we prevent medication errors

Objectives: The purpose of this quality improvement analysis is to determine the incidence, type, and severity of medication errors in pediatric discharge medication reconciliations identified by clinical pharmacists. Additionally, we sought to identify themes in errors that could be addressed through quality improvement interventions.

Methods: This is a retrospective, post-interventional quality improvement analysis. Patients were included if they were discharged from the Barbara Bush Children's hospital between August 2020 and November 2021. During the study period, pediatric clinical pharmacists received an electronic notification within the medical record whenever a discharge medication order was signed. Pharmacists then reviewed these orders and intervened when necessary to optimize medication therapy. These interventions were documented in the electronic medical record. This report described the outcomes of this project to date. Errors were classified according to the National Coordinating Council for Medication Error Reporting and Preventions (NCC MERP) standards by author consensuses. Data abstracted from the medical record include drug, dose, frequency, a description of the error as reported by the pediatric clinical pharmacists, the type of error. Data were analyzed with descriptive statistics.

Results: During the 15-months study period, a total of 79 interventions were documented by pediatric clinical pharmacists. The median age 8 years and median hospital length of stay was 2 days. Of the 79 interventions documented, the most common types of errors were incorrect frequency (34%) followed by incorrect dose (28%). The most common incorrect frequency was PRN indications on pediatric discharge prescriptions. NCC MERP severity of error A, B, and C were the only categories observed in this pilot. Further, among the documented errors, antimicrobials, benzodiazepine, and opioid medication classes were the most intervened on and had either incorrect frequency or incorrect dose as the most common errors on discharge prescriptions.

Conclusions: In this discharge medication review pilot, pharmacists intervened 79 times and 73% of errors did not reach the patient. This study highlights the value of pharmacist medication reconciliation at hospital discharge.
Conference Abstracts
May 16-18, 2022

Presenter Name: Troy, Samantha
Organization: Tufts Medical Center
Category: Medication Safety
Day | Session | Room | Time: Wednesday | 5 | Magnolia D | 1:30:00 PM

Authors: Samantha Troy, PharmD; Stacey Benotti, PharmD; Andrea Glennon, PharmD, BCCCP

Title: Preventing medication delivery delays through pharmacy staff education

Objectives: Initiation of therapy and timely administration of medications can influence patient outcomes. Delays in the availability of these medications can interfere with proper administration and negatively impact patient care. We sought to investigate the common causes of medication delays and implement pharmacy staff education to reduce the number of delays in an academic medical center.

Methods: Phase I of data collection consisted of collecting messages sent from nursing across all shifts, 24 hours a day, for 14 days in November 2021. Messages were sorted and grouped into common causes. The most common cause of delays became the focus of the pharmacy education. To ensure training occurred across all shifts, we assigned an electronic training module to all pharmacists and technicians. Additionally, we created a paper training document for technicians to reinforce appropriate use of automated dispensing cabinets. Phase II of data collection will occur across all shifts for 14 days in March 2022. The volume of messages and causes of the delays in phase II will be compared to phase I data.

Results: Ten categories of medication delays were identified in the phase I data, with non-IV patient-specific medication delays as the most common cause of nursing messages. Further analysis and comparison of phase I and phase II data will be completed to determine if the education and training had an impact on the number of delays, and results will be presented.

Conclusions: It is anticipated that the educational tools implemented will make a positive impact on patient care by reducing the number of medication delays, however, this project also helped identify several other underlying causes of medication delays. The findings from this project will be used to drive further hospital improvement initiatives focused on reducing medication delays.
Evaluating the impact of iron dextran compared to iron sucrose on safety and clinical outcomes in pregnant and postpartum patients with iron deficiency anemia

Objectives: In 2019, the World Health Organization estimated that 36.5% of pregnant women and 29.9% of women of reproductive age globally suffer from iron deficiency anemia. At ChristianaCare, several formulations of intravenous (IV) iron were prescribed to pregnant and postpartum patients, most commonly iron sucrose, to treat iron deficiency anemia refractory to oral iron supplementation. In August of 2020, an institution specific guidance on iron supplementation in pregnancy was introduced to standardize the use of iron dextran in this population due to ease of use, cost, and compliance. The purpose of this retrospective cohort study was to assess the safety and clinical outcomes of iron dextran in pregnant and postpartum patients compared to iron sucrose in both the inpatient and outpatient settings.

Methods: A total of 504 pregnant and postpartum patients received at least 1 dose of iron sucrose or iron dextran during the intervention period and were eligible for inclusion in this study. Of the 504 eligible patients, a retrospective chart review was performed on a random sample of 140 adult pregnant and postpartum patients who received at least 1 dose of iron sucrose (n=70) from January 1, 2019 to October 31, 2019 or iron dextran (n=70) from January 1, 2021 from October 31, 2021. The primary outcome was the composite occurrence of a safety event, including anaphylaxis reaction, infusion reaction, infusion interruption, or administration of rescue medications. Secondary outcomes included composite incidence of adverse infant/pregnancy events, composite occurrence of safety events in the setting of premedication use, mean therapy compliance and mean change from baseline to follow-up levels of hemoglobin, hematocrit, serum iron, serum ferritin, total iron binding capacity, and transferrin saturation.

Results: The composite incidence of a safety event occurred in 2.9% of the iron dextran group and 4.3% of the iron sucrose group (p=1.00). Secondary endpoints will be compiled, and results will be presented.
**Conclusions:** It is anticipated that this study will help to characterize the safety and clinical outcomes of IV iron in obstetric patients and identify potential areas of improvement for prescribing and monitoring of IV iron therapy.
Conference Abstracts
May 16-18, 2022

Presenter Name: Alkhaled, Humam
Organization: MedStar Washington Hospital Center
Category: Oncology
Day | Session | Room | Time: Monday | 2 | Magnolia D | 4:15:00 PM

Authors: Humam Alkhaled, PharmD, and Quan Li, PharmD, BCOP, BCPS, DPLA
Title: Marijuana, Dietary Supplement, and Special Diet Use in African American Hematology/Oncology Patients

Objectives: Marijuana, dietary supplements, and special diets are associated with distinct health outcomes in cancer patients. Marijuana is suggested to alleviate the symptoms of pain, nausea and vomiting, loss of appetite, and mental distress associated with cancer and/or side effects of cancer therapies. Dietary supplements, like vitamin D and calcium (Ca), have been linked to cancer risk and prevention. Whereas special diets, like the The Mediterranean diet has been associated with a reduction in breast cancer incidence. Further research is needed to investigate the use of marijuana, dietary supplements, and special diets in cancer patients. Minority groups, including African American (AA) patients, are greatly underrepresented in current research despite being disproportionately affected by several types of cancer. Prioritizing research on marijuana, dietary supplement use, and special diets in AA hematology/oncology patients is needed to enhance knowledge on the use of such products and improve patient care.

Methods: A cross-sectional survey will be conducted at Medstar Washington Hospital Center Cancer Institute. Informed consent will be obtained by participants and will remain anonymous. The survey will target AA hematology/oncology patients who are 18 years and older. The survey questionnaire will include three main parts of patient demographics, medical history, marijuana, dietary supplement use, and special diets. The medical history will consist of cancer type and cancer diagnosis date. Marijuana, dietary supplements, and special diets section will include an indication, type, route of administration, length and frequency of use, benefit, adverse events, and whether it was recommended by a healthcare professional or others.

Results: Results are still in progress and not available at this time. The outcomes of this study are: Primary outcome: â€¢ Prevalence of marijuana, dietary supplements, and special diets in AA hematology/oncology patients and their indications. Secondary outcomes: â€¢ Reported clinical benefits of marijuana, dietary supplements, and special diets in this patient population. â€¢ The use of different routes of administration for marijuana and related clinical benefits. â€¢ Incidents of adverse events reported using marijuana, dietary supplements, and special diets.

Conclusions: The study conclusion cannot be determined due to the lack of results at this time. Once the results are finalized, the conclusion can be completed. The study anticipates
determining the prevalence of use of marijuana, dietary supplements, and special diets in African American hematology/oncology patients.
Evaluation of Clotting and Bleeding Risk Associated with the Use of Asparaginase Products in Patients with Acute Lymphoblastic Leukemia

Objectives: Chemotherapy regimen, obesity and advanced age are risk factors for development of venous thromboembolisms in acute lymphoblastic leukemia (ALL) patients. Pegaspargase and erwinia asparaginase are two asparaginase products utilized for the treatment of ALL that have been shown to increase a patient's risk of developing a thrombus. However, bleeding is another adverse effect associated with asparaginase products. Due to there being a risk of both clotting and bleeding, it is controversial as to whether patients who are receiving ALL therapy with asparaginase products should receive anticoagulation as part of their treatment. The primary outcome for this retrospective study was rate of any clotting events defined as an arterial thrombus (ATE), deep vein thrombus (DVT) or pulmonary embolism (PE) in patients receiving treatment for ALL with asparaginase products. Secondary outcomes included rate of clotting or bleeding events based on various patient factors: type of clot, age, body mass index, cumulative dose of asparaginase products, asparaginase dose capping, phase of treatment, or asparaginase product received. Another secondary outcome included rate of any major bleeding events.

Methods: This was an institutional review board approved retrospective chart review of patients who were treated for ALL using asparaginase products (pegaspargase and erwinia asparaginase). Patients of any age were included if they had received at least one dose of an asparaginase product for treatment of ALL at University of Rochester Medical Center as an inpatient or outpatient. The patients must have received their first dose of an asparaginase product between January 1, 2013 and July 31, 2021. Data was collected through August 31, 2021 to evaluate clotting or bleeding risk 30 days following their last dose of an asparaginase product.

Results: This study included 126 subjects with 467 administrations of asparaginase products. 16 clotting events occurred (1 ATE, 13 DVTs and 2 PEs). The cumulative incidence of first clot was 6.0 first clots / 100 person years at risk (95% CI: 0.84 -42.7). 16 of 126 subjects (13%) of patients experienced a clotting event within 30 days of an asparaginase dose. All clotting events
occurred after administration of pegaspargase. The cumulative incidence of clot by day 30 was 9.5% (95% CI: 5.2% -15.4%). The median time to clotting event in days was 17.5 days (range 7-185). 75% of clotting events occurred during induction therapy. 4 major bleeding events occurred on pegaspargase. The cumulative incidence of major bleed by day 30 was 1.6% (95% CI: 0.3% -5.1%). 75% of bleeding events occurred during consolidation.

**Conclusions:** The incidence of major clotting events in the first 30 days of pegaspargase administration is higher than the incidence of major bleeding events (9.5% vs. 1.6% respectively). The majority of clots occurred during induction, while the majority of bleeds occurred during consolidation. Future studies can examine the benefit of anticoagulation prophylaxis for patients receiving asparaginase products during induction.
Presenter Name: Crossley, Brian
Organization: Beth Israel Deaconess Medical Center
Category: Oncology
Day | Session | Room | Time: Wednesday | 6 | Magnolia A | 2:45:00 PM

Authors: B. Crossley, PharmD; G. Bubley, MD; D. Einstein, MD; K. Mahoney, MD, PhD; R. Bhatt, MD, PhD; M. Garnick, MD; ME Morrissey, RN; S. Warack, PharmD, BCOP; J. Stevens, PharmD, BCOP

Title: Testosterone Breakthrough Risk with Eligard® vs Lupron® During Drug Shortage

Objectives: We aim to examine the rates of testosterone breakthrough in prostate cancer patients on Eligard® versus patients on Lupron® therapy.

Methods: This is a single-center, retrospective, observational cohort study. Patients who received 3-mo depots of Lupron® or Eligard® for prostate cancer from Aug 2019-Aug 2021 are included. Patients who received GnRH therapy with Eligard® or Lupron® for indication other than prostate cancer, receipt of GNRH agonist formulation other than 3-month depot, and women are excluded. Our primary endpoint is the rate of testosterone breakthrough, defined as >50 ng/ml, with Lupron® vs. Eligard® in patients with a follow up testosterone level within 1-3.5 months after each dose. A confirmatory analysis will be performed on patients who underwent a reverse switch from Eligard® to Lupron®. Secondary endpoints include rate of testosterone breakthrough of all doses of Lupron® or Eligard® and testosterone breakthrough rate per dose in patients who only received Lupron® or Eligard®.

Results: Results pending

Conclusions: Conclusion pending
Risk factors associated with invasive fungal infection in patients undergoing induction chemotherapy for acute myeloid leukemia: a case-control study

**Objectives:**
Patients with acute myeloid leukemia (AML) are at high risk for developing invasive fungal infections (IFIs) during induction chemotherapy, which poses a significant risk of morbidity and mortality. This risk is thought to be greater in patients that require re-induction or salvage induction. The primary objective of this study was to estimate the risk of developing an IFI associated with a risk-stratified antifungal prophylaxis strategy (fluconazole for first induction and voriconazole for subsequent inductions) compared to a non-risk stratified approach (posaconazole for all inductions) in patients undergoing induction chemotherapy for AML. Secondary objectives included identifying additional risk factors associated with the incidence of IFIs in this patient population.

**Methods:**
A retrospective chart review was conducted for all adult patients with AML undergoing induction, re-induction, or salvage induction chemotherapy at University of Rochester Wilmot Cancer Center from January 31st, 2013, through January 31st, 2021. Patients were separated into two groups based on whether they received a risk-stratified or non-risk-stratified antifungal prophylaxis strategy. The primary outcome was possible, probable, or proven IFIs defined by the European Organization for Research and Treatment of Cancer (EORTC). Secondary outcomes included rates of isolated direct fungal tests, rates of persistent fever unresponsive to broad spectrum anti-fungal agents for 72 hours or greater, switch to other systemic antifungal therapy, amphotericin use, and 100-day mortality from fungal infection.

**Results:**
Finalized results will include median and interquartile ranges for continuous variables and counts and proportions for categorical variables. The results will estimate the rate of (possible, probable, or proven) IFIs for a risk-stratification and non-risk stratification anti-fungal prophylaxis strategy. Rates will be presented with associated exact binomial two-sided confidence intervals. Univariate logistic regression will be used to estimate the odds ratio associated with the change in risk stratification on the outcome of IFI. Results of a multivariate logistic regression will be used to identify independent risk factors associated with IFI. Secondary outcomes will be analyzed similarly.
Conclusions: It is anticipated that the results will demonstrate similar risks associated with IFIs when using a risk-stratified compared to a non-risk stratified antifungal prophylaxis strategy in patients undergoing intense induction, re-induction, or salvage induction chemotherapy for AML.
Presenter Name: Gallo, Melissa  
Organization: Highland Hospital  
Category: Oncology  
Day | Session | Room | Time: Monday | 2 | Magnolia D | 4:30:00 PM

Authors: Delibert K, Gallo M, Gowen S, Treptow C

Title: Real world use of venetoclax in combination with a hypomethylating agent or low-dose cytarabine for myeloid leukemias at an academic medical center

Objectives: The purpose of this study was to assess the remission rates of patients who received treatment for myeloid leukemias with venetoclax at Wilmot Cancer Institute (WCI), which incorporates rural offsite cancer centers and a main campus at an academic medical center. Additionally we aimed to assess how often elements of venetoclax treatment, such as days administered per cycle and dose or cycle delays, were consistent with current evidence-based recommendations.

Methods: This was a single center, retrospective cohort study. Adult patients being followed by WCI were included if they completed at least one cycle of venetoclax in combination with a hypomethylating agent (HMA) or low-dose cytarabine (LDAC) for treatment of either acute myeloid leukemia (AML) or myelodysplastic syndrome (MDS) between January 31st, 2019 and July 31st, 2021. Patients were excluded if they were enrolled in a clinical trial for AML or MDS during their venetoclax treatment, if they transferred out of network prior to completing one treatment cycle, or if they were treated with venetoclax monotherapy. The primary outcome was composite complete remission in AML patients, defined as a patient achieving either complete remission (CR) or complete remission with incomplete hematologic recovery (CRi).

Results: A total of 66 AML patients were included in the analysis. Mean age was 68 years and forty (61%) patients were male. Forty-three (65%) AML patients had a denovo diagnosis, and twenty-three (35%) had a secondary diagnosis. Thirty-three (50%) patients received venetoclax as part of their first-line treatment for AML. Composite remission was seen in thirty-one (47%) patients, seventeen (26%) of which achieved remission after cycle 1. A total of twenty-nine (44%) patients had at least one component of their venetoclax treatment differ from available recommendations. Of note, six (9%) patients were nonadherent to venetoclax, six (9%) patients were initiated on venetoclax at less than 28 days per cycle, twelve (18%) patients had their cycles inappropriately held, and eleven (17%) patients had their venetoclax duration per cycle inappropriately decreased in response to adverse events. Results for MDS patients will be presented.

Conclusions: Composite remission rates for AML at WCI were lower than remission rates seen in the VIALE-A efficacy trial. This difference may potentially be explained by the fact that many
patients at our centers had venetoclax cycles delayed or durations decreased prior to achieving remission. Pharmacists can assist in the treatment of AML with venetoclax by providing medication counseling to patients, ensuring patients are started on recommended dosing as appropriate, and assisting the team in making evidence-based adjustments to venetoclax regimens.
Evaluating the impact of a clinical pharmacist in patients receiving new chemotherapy for breast cancer: analysis of a pilot study

**Authors:** Carissa Joelle Ganihong, PharmD, Anshika Singh, PharmD, BCOP, Roseanne DiMarco, PharmD, BCPS, BCOP

**Title:** Evaluating the impact of a clinical pharmacist in patients receiving new chemotherapy for breast cancer: analysis of a pilot study

**Objectives:** Breast cancer treatment may include chemotherapy, which is associated with significant cardiac, gastrointestinal, hematologic, and hepatic toxicities. Clinical pharmacists in the outpatient oncology setting can optimize patient outcomes by providing patient and family education, therapeutic drug monitoring, supportive care management, and assistance with medication access, among other activities. Categorizing and evaluating a clinical pharmacist's interventions in a breast cancer clinic for patients undergoing new chemotherapy will better elucidate the impact of ambulatory clinical pharmacists and may result in re-evaluation of current practices to improve patient care.

**Methods:** At the Sidney Kimmel Cancer Center at Jefferson Health in Center City, Philadelphia, a pilot program was developed to add an oncology clinical pharmacist to the breast cancer clinic. The pharmacist worked closely with one breast medical oncologist two days per week, averaging 12-18 visits per day. This single-center retrospective chart review assesses interventions made by the clinical pharmacist in patients at least 18 years old who presented to the breast clinic between September 1, 2020, and February 28, 2021, for new chemotherapy for any stage of breast cancer. Patients less than 18 years old were excluded. Baseline characteristics include age, gender, race, chemotherapy regimen, stage, HER2/ER/PR status, and line of therapy. The primary outcome is to categorize and quantify interventions made at a follow-up encounter, including reported side effects, supportive care recommendations, recommendation detail, encounter type, number of days after the first cycle to a follow-up visit, and time spent. Secondary outcomes include categorization of interventions at the initial visit and number and categorization of total interventions within the study timeframe.

**Results:** Of 575 documented interventions, 207 patients were assessed for eligibility. There were 65 patients who met inclusion criteria, for whom the oncology clinical pharmacist made 255 interventions. Of the 65 patients, 44 had direct patient-pharmacist interactions and were included in the primary analysis. Additional results will be presented.

**Conclusions:** This study will quantify the impact of a clinical pharmacist in a breast cancer clinic. It is anticipated that this project will show that the clinical pharmacist had a significant role
in supportive care management, demonstrated by the identification of corresponding pharmacist interventions per side effect reported.
**Title:** Levofloxacin prophylaxis for myeloablative allogeneic hematopoietic cell transplant recipients

**Objectives:** Allogeneic hematopoietic cell transplant (alloHCT) is a potentially curative intervention for patients with hematologic malignancies, but is associated with a high risk of infection. The utility of fluoroquinolone prophylaxis remains unclear due to increasing antibiotic resistance and risk of Clostridium difficile infection. This single center retrospective cohort study aims to characterize the incidence of pre-engraftment gram-negative (GN) bacteremia in patients undergoing myeloablative conditioning (MAC) followed by alloHCT who did or did not receive levofloxacin prophylaxis.

**Methods:** This study is a retrospective chart review evaluating adults transplanted between January 2016 - August 2021. During this period, the institutional standard of care changed to implement levofloxacin prophylaxis following MAC. This study aims to assess pre- and post-intervention incidence of GN bacteremia. Patients received levofloxacin 500 mg daily from day zero until engraftment (absolute neutrophil count >500/mm3) or started on definitive therapy for NF or other infection. Patients with a levofloxacin allergy or intolerance were excluded. The primary endpoint was the incidence of pre-engraftment GN bacteremia. Secondary objectives include comparing the incidence of neutropenic fever (NF), medical intensive care unit (MICU) transfer, and length of hospital stay (LOS) between groups. Chi-squared and Wilcoxon Rank Sum Tests were used to analyze discrete and non-parametric continuous data, respectively. The study was approved by the University of Pennsylvania Institutional Review Board.

**Results:** A total of 152 patients with a median age of 48 years (range, 21-67 years) who underwent MAC alloHCT were included, 76 in each group. There were no significant differences in baseline characteristics. Levofloxacin prophylaxis significantly reduced incidence of pre-engraftment GN bacteremia from 18% to 4% (HR 0.21; 95% CI 0.06-0.72; p=0.0084, NNT = 7). The risk of NF was reduced with levofloxacin prophylaxis (93% vs. 80%, HR 0.86; 95% CI 0.78-0.97; p=0.029). There were no significant differences in incidence of MICU transfer (p=0.53). There was a trend towards for shorter LOS with levofloxacin (26, range 19-167) vs. 28 (range 19-75) days, respectively (p=0.097).
**Conclusions:** Levofloxacin prophylaxis was effective in reducing incidence of GN pre-engraftment bacteremia in patients undergoing MAC alloHCT.
Authors: A. Hutchinson, C. McLellan, A. Krevat

Title: Same-day versus next-day administration of pegfilgrastim in neutropenia prevention

Objectives: To determine if same-day administration of pegfilgrastim is as effective at preventing neutropenia and/or febrile neutropenia as next-day administration after receiving continuous infusion (CIV) 5-fluorouracil (5FU) chemotherapy. The data provided by this research will expand upon current evidence and help guide clinical decisions regarding the two different administration techniques.

Methods: This is a retrospective chart review of adult patients who have received same-day or next-day pegfilgrastim after CIV 5FU as a part of one of the following backbone regimens for gastrointestinal (GI) malignancies: FOLFOX, FOLFOXIRI, FOLFIRI, and FOLFIRINOX. The primary outcome was incidence of grade 3 or 4 neutropenia, and/or febrile neutropenia. Secondary outcomes included incidence of neutropenic complications resulting in hospitalizations, dose modifications to chemotherapy agents, and delays in chemotherapy administration. Data was collected from April 2020 through February 2022. Study inclusion required age > 18, diagnosis of GI malignancy, treatment with CIV 5FU, and at least one cycle of 5FU and pegfilgrastim. Patients were excluded if they received less than 6mg of pegfilgrastim for any reason.

Results: Data from December 2021 through February 2022 is still being evaluated. Preliminary analysis of data from April 2020 through November 2021 showed a total of 42 patients and 262 administrations of CIV 5FU and pegfilgrastim. There were three instances of neutropenia in the next-day administration arm (n=137, 2.2%), and four in the same-day administration arm (n=125, 3.2%). A chi-squared test between groups showed no significant difference in the occurrence of grade 3 or 4 neutropenia (p=0.6125). There were zero instances of febrile neutropenia in the next-day arm, and one instance in the same-day arm (0.8%). Of the neutropenic patients in the next-day arm (n=3) the mode of neutropenia was grade 3, the average length of neutropenia was six days, and there were treatment delays and dose modifications in each instance. In the same-day arm (n=4) the mode of neutropenia was grade 3, the average length of neutropenia was five days, there were two instances of hospitalizations (50%), three instances of treatment delays (75%), and one instance of dose modifications (25%).
Conclusions: Results may change with the additional analysis of patients through February 2022, but at this time there was no significant difference in the incidence of grade 3 or 4 neutropenia, and/or febrile neutropenia in same-day compared to next-day administration of pegfilgrastim. Both administration methods resulted in similar instances and length of neutropenia, dose modifications, and treatment delays. Preliminary data suggests same-day administration can be considered for patients with GI malignancies receiving CIV 5FU based regimens.
**Conference Abstracts**  
**May 16-18, 2022**

**Presenter Name:** Ivey, Katelin  
**Organization:** Geisinger  
**Category:** Oncology  
**Day | Session | Room | Time:** Wednesday | 6 | Magnolia A | 3:00:00 PM

**Authors:** Katelin Ivey, PharmD, Tristan Maiers, PharmD, BCOP, Justine Maley, PharmD  
**Title:** Incidence of Febrile Neutropenia in Patients Receiving Palbociclib

**Objectives:** Palbociclib is indicated for the treatment of hormone receptor (HR)-positive, human epidermal growth factor receptor 2 (HER2)-negative advanced or metastatic breast cancer adult patients. When patients experience a minimum of grade 3 neutropenia, the palbociclib package insert recommends therapy to be held to allow for absolute neutrophil count (ANC) recovery. The primary outcome of this study was to identify the incidence of febrile neutropenia in the setting of grade 3 or grade 4 neutropenia.

**Methods:** This was a retrospective, cohort study that included patients who were 18 years of age or older and experienced grade 3 or 4 neutropenia. The primary outcome of this study was the incidence of febrile neutropenia as defined as a single body temperature of >38.3°C (101°F) or a temperature of >38.0°C (100.4°F) sustained for >1 hour within 7 days of grade 3 or 4 neutropenia. Statistical testing was performed using XRealStats.

**Results:** Grade 3 and grade 4 neutropenia occurred in 80 out of 200 total patients (40%) who received palbociclib for a total of 387 occurrences. Of those occurrences, there were 370 occurrences of grade 3 neutropenia compared to 17 occurrences of grade 4 neutropenia. Febrile neutropenia occurred in 10 patients (2.7%) with grade 3 neutropenia while no occurrences during grade 4 neutropenia (RR=1.0189, CI 95% 0.0621-16.7109, p=1). Out of the 80 patients, there were 72 patients (90%) that received Medication Therapy Disease Management (MTDM) services. The median occurrence of grade 3 neutropenia for patients followed by the pharmacist managed MTDM service was 2 compared to 3.5 for those followed by physicians only. A subgroup analysis of the 10 occurrences of febrile neutropenia revealed that pharmacists identified neutropenia in 80% of occurrences prior to illness and assessed medication restart for 60% of those patients.

**Conclusions:** In patients who received palbociclib, the relationship between the incidence of febrile neutropenia in the setting of grade 3 or grade 4 neutropenia was concluded to be nonsignificant. It may be suggested that pharmacist managed MTDM services contribute to recognition of neutropenia and febrile neutropenia resulting in improved patient outcomes.
Impact of steroid prophylaxis on engraftment syndrome outcomes in multiple myeloma patients undergoing autologous stem cell transplant

**Objectives:** Engraftment syndrome (ES) is a complication that may occur early after hematopoietic stem cell transplant (HSCT) during the neutrophil recovery phase. ES may be defined using the Maiolino Criteria, but many institutions also utilize a clinical ES definition based on patient symptomatology. Although it is typically self-limiting, some patients experience severe symptoms that may lead to prolonged hospitalizations and significant morbidity and mortality. The treatment of choice for ES is corticosteroids. Corticosteroids have also been studied as prophylaxis; past retrospective studies have shown that this may reduce the incidence of ES, and a trend toward decreasing hospital length of stay was observed. This study aims to evaluate the effect of utilizing steroid prophylaxis on engraftment syndrome outcomes, including hospital length of stay, in multiple myeloma patients who have undergone autologous HSCT.

**Methods:** This is an IRB-approved, retrospective, observational chart review that includes adult patients with multiple myeloma who underwent autologous HSCT in 2021. Patients were included if they are ≥18 years of age, have multiple myeloma, and received a pre-transplant conditioning regimen of melphalan or melphalan-bortezomib. Exclusion criteria include: biopsy-proven autologous graft versus host disease, receiving systemic steroids for other indications, lost to follow up, received a propylene glycol-free formulation of melphalan, or had a definite microbiological infection within 72 hours of initiating treatment-dose steroids. The primary endpoint is hospital length of stay. Secondary endpoints include incidence of ES, incidence of clinical ES, 30-day readmission rates, 30-day overall survival (OS), and the incidence of definite infections within 30 days of steroid initiation.

**Results:** A total of 212 transplants were included in this study. Of these, 148 (69.8%) did not receive steroid prophylaxis and 64 (30.2%) did receive steroid prophylaxis. The median length of stay was similar in both treatment groups (14 vs. 13 days, p = 0.529). The incidence of clinical ES was significantly higher in the no prophylaxis group compared to the prophylaxis group (37.2% vs. 10.9%, p < 0.001). The incidence of ES, 30-day readmission rates, 30-day OS, and definite infections were all similar between the two treatment groups.
**Conclusions:** The results of this study support the use of steroid prophylaxis to prevent clinical ES symptoms after an autologous HSCT in patients with multiple myeloma. Although adding steroid prophylaxis did not reduce length of stay, it helped to reduce the incidence of ES symptoms around the time of engraftment, such as fever, diarrhea, skin rash, pulmonary infiltrates, or hepatic dysfunction.
**Objectives:** The addition of immunotherapy administered with chemotherapy for the treatment of extensive stage small cell lung cancer (ES-SCLC) has demonstrated an increased progression free survival and overall survival compared to chemotherapy alone. At Penn Medicine atezolizumab and durvalumab are restricted to the ambulatory care setting and not administered to inpatients with cycle one of chemotherapy. Due to the response time associated with immunotherapy, it may be crucial to start immunotherapy with the initial chemotherapy regimen. Our study aims to characterize the outcomes associated with delayed initiation of immunotherapy including overall survival and progression free survival.

**Methods:** A retrospective observational study will be conducted to characterize the outcomes associated with delayed initiation of immunotherapy in patients with ES-SCLC. Patients 18 years or older who received a chemotherapy regimen containing a platinum plus etoposide for documented treatment naïve ES-SCLC, will be included. Only patients intended to receive atezolizumab or durvalumab within the time period of April 2017 to April 2021 at an institution within the Penn Medicine health system will be included. Patients will be excluded if they transferred outside of the health system within the study timeframe. The primary endpoint will be overall survival, defined as the time from chemotherapy cycle day one to death from any cause. The secondary endpoint will be progression free survival, defined as the time from start of chemotherapy cycle one day one to therapy switch due to progression. Patients will be grouped into those who received immunotherapy with cycle one of chemotherapy, inpatients treated with chemotherapy who had immunotherapy delayed to cycle two of chemotherapy, and outpatients who had immunotherapy delayed at least one week.

**Results:** The median overall survival and progression free survival for each group will be presented.

**Conclusions:** It is anticipated that the delayed initiation of immunotherapy in ES-SCLC patients will impact overall survival and progression free survival.
**Author(s):** A. Liu; R. Browne; M. Goldfinger; K. Pradhan; C. Palesi; Montefiore Medical Center, Bronx, New York

**Title:** Optimal timing of filgrastim initiation after autologous hematopoietic cell transplantation

**Objectives:** Objective: One of the major causes of morbidity and mortality in autologous hematopoietic stem cell transplantation (aHSCT) is infection resulting from prolonged neutropenia. Filgrastim (G-CSF) is one of the most common colony stimulating factors used to expedite neutrophil recovery. However, there is currently no consensus on the optimal time to initiate filgrastim following aHSCT. Several studies have evaluated the impact of filgrastim on the time to neutrophil engraftment using an early initiation strategy versus a late initiation strategy. However, one of the primary limitations of these studies has been small sample size. The objective of this study is to determine the difference in time to neutrophil engraftment in patients with multiple myeloma or lymphoma who received filgrastim on day +1 compared to those who received it on day +5 post aHSCT at Montefiore Medical Center.

**Methods:** This study is a single-center, retrospective chart review of patients who were diagnosed with multiple myeloma or lymphoma (Hodgkin disease /non-Hodgkin lymphoma) and who received an aHSCT followed by filgrastim post-transplant administered on either day +1 or day +5. As the day for initiation of filgrastim changed in January of 2007 from day +1 to day +5, the first cohort of patients (early strategy) will be those who received an aHSCT followed by day +1 filgrastim from January 2003 through December 2006. The second cohort of patients (late strategy) will be those who received an aHSCT followed by day +5 filgrastim from January of 2007 through December of 2011.

**Results:** Results regarding time to neutrophil engraftment, time to platelet engraftment, and Length of hospitalization post-transplant will be presented.

**Conclusions:** As the need of aHSCT in patients with multiple myeloma or lymphoma (HD/NHL) rises in the United States, this study will offer more defined guidance on the optimal timing of G-CSF initiation following aHSCT. By optimizing our dosing strategy throughout our medical center, we will improve the care our patients receive, which in turn, will lead to better patient experience and outcomes. If our study finds that a delay in the initiation of filgrastim (day +5) has no clinically significant difference when compared to early initiation (day +1), it will reduce the number of injections, reducing pharmacy and nursing workloads and the costs associated with the drug therapy and overall hospitalization. However, if our study finds that a delay in the
initiation of filgrastim results in increased risk of infection or longer hospitalization, we will need to optimize our current dosing strategy which may change the workload of pharmacy and nursing departments
Evaluation of Angiotensin-Converting Enzyme Inhibitors and/or Beta-Blockers in Primary Prevention of Cardiac Dysfunction Caused by Anthracyclines and Trastuzumab in African American Breast Cancer Patients

Objectives: Among women diagnosed with breast cancer, African Americans have significantly higher mortality rates than White women and are at higher risk of developing cardiovascular disease due to greater rates of obesity, diabetes, hypertension, and ESRD. Anthracyclines and trastuzumab are commonly used for the treatment of breast cancer and carry Black Box Warnings (BBWs) for myocardial damage and cardiac failure. Beta Blockers (BBs) and Angiotensin-Converting Enzyme Inhibitors (ACEIs) have been the most frequently investigated pharmacologic options for cardio-protection. This project was designed to determine whether the use of ACEI and/or BB may prevent cardiac damage in African American breast cancer patients receiving cardio-toxic chemotherapy regimens.

Methods: Medical records of African American patients with breast cancer of any severity treated with trastuzumab or any anthracycline between January 2015 - June 2021 with documented echocardiogram were reviewed. The following data was collected: age, cardiovascular risk factors (hypertension, diabetes, smoking, obesity (BMI > 40), ESRD, heart failure, history of myocardial infarction), stage of cancer, ER/PR (+), HER2 (+), LVEF and troponin I levels at baseline, 3-6 months, 7 months-1 year, and 2-3 years, treatment drug, duration, cumulative dose (anthracyclines); use of any BB and/or ACEI drug, dose, and duration. Primary outcome measured was cardiac dysfunction, defined as a decrease in LVEF ≥ 10% in patients whose LVEF is ≥ 50% or drop in LVEF of at least 5% from baseline in patients whose LVEF decreases to < 50%. Secondary outcomes included clinical cardiotoxicity, defined as any interruption in trastuzumab or anthracycline therapy for ≥ 7 days as a result of a decline in cardiac function, troponin I levels at 3-6 months, 7 months - 1 year, and 1-2 years.

Results: Preliminary data is as follows: out of 88 patients evaluated, 17 patients (20%) were found to be on an ACEI or BB prior to starting chemotherapy. Of these 17 patients, 0/17 experienced cardiotoxicity. In contrast, 24% (17/71) patients who were not on ACEI or BB prior to starting chemotherapy experienced cardiotoxicity. Overall, 80% (70/88) of patients did not experience cardiotoxicity after undergoing treatment with either trastuzumab or any...
anthracycline. Final results including demographic data, differences between subgroups, and secondary outcomes will be reported within the final manuscript.

**Conclusions:** It is anticipated that this project will demonstrate the benefit of ACEI and/or BB to prevent cardiac damage in African American breast cancer patients receiving cardio-toxic chemotherapy regimens.
Impact of pre- and post-subcutaneous daratumumab implementation on the rate of hypersensitivity reactions

Authors: Krishna Patel, PharmD, Jiyeon Joy Park, PharmD, BCOP, Michael Kane, RPh, BCOP; Robert Wood Johnson University Hospital and Rutgers Cancer Institute of New Jersey, New Brunswick, New Jersey

Title: Impact of pre- and post-subcutaneous daratumumab implementation on the rate of hypersensitivity reactions

Objectives: Subcutaneous (SC) daratumumab and hyaluronidase-fihj, approved in 2020 for the treatment of relapsed/refractory multiple myeloma, has a shorter duration of administration and a lower rate of hypersensitivity reactions compared to intravenous (IV) daratumumab as demonstrated in clinical trials. However, there is limited real-world data comparing the rate of hypersensitivity in SC versus IV formulations. The objective of this study is to assess the impact of SC daratumumab versus IV daratumumab on the rate of hypersensitivity reactions.

Methods: This study was a single-center, retrospective chart review which included patients who received either intravenous (IV) daratumumab or subcutaneous (SC) daratumumab from April 1st, 2020 to August 31st, 2021. Patients who developed hypersensitivity reactions to any medications administered on the same day as daratumumab were excluded. The primary endpoint was the rate of hypersensitivity reactions as shown by the use of rescue medications for hypersensitivity reactions as a surrogate marker; and key secondary endpoints were the use of pre-medications and use of daratumumab in off-label combination regimens.

Results: Eighty-four patient charts were analyzed of which 43 (51%) patients were female, 42% were White, and the median age was 65. Forty-five patients (54%) received at least one dose of SC daratumumab and 39 patients (46%) received at least one dose of IV daratumumab. Twenty-two patients (56%) in the IV arm switched over to the SC formulation, while only 1 patient (2.2%) in the SC arm switched over the IV formulation for reasons unknown. No hypersensitivity reactions were reported in either group. Pre-medications were given to all patients, and daratumumab was used off-label in 7 patients (8.3%).

Conclusions: No numerical difference in hypersensitivity reactions was demonstrated between IV and SC daratumumab groups, which can be attributed to the small sample size. Future directions include expanding the timeline to include more patients in the study.
Authors: William P. Raley Jr.; Daniel J. Rubin; Kristine A. Zborowski; Rich Kriska; Joseph K. Favatella; Donna Capozzi; Mitchell E. Hughes

Title: Venetoclax medication persistence for the treatment of chronic lymphocytic leukemia/small lymphocytic lymphoma (CLL/SLL)

Objectives: Venetoclax is a BCL2 inhibitor indicated for CLL/SLL and acute myeloid leukemia. At this time, medication persistence is not well defined for oral oncolytic therapies and what is published is limited to large claim database studies which may lack additional insight for the reason of discontinuation. Our research objective was to identify the timing and reason for discontinuation of venetoclax in the CLL/SLL population at a health-system specialty pharmacy.

Methods: This retrospective, observational, descriptive cohort study investigated patients who received a prescription for venetoclax for CLL/SLL between April 1st 2016 and August 31st 2021 at the Penn Specialty Pharmacy. The first specific aim was to identify the number of patients who discontinued venetoclax at 30, 90, 180, 365, 540, and 730 days from venetoclax initiation. The second specific aim was to identify the reason for discontinuation of venetoclax. Patients included in this study must have received venetoclax either as monotherapy or in combination with an anti-CD20 monoclonal antibody. Data was collected via chart review. We hypothesize a majority of patients will have discontinued venetoclax within 365 days and the major reason for discontinuation would be due to disease progression.

Results: A total of 447 patients prescribed venetoclax were screened for inclusion in this interim analysis. There were 93 unique patients identified who met inclusion criteria with 95 individual starts of venetoclax (93 new starts and 2 re-starts). Median (IQR) age at venetoclax start was 67 (62 to 75.5). Median time on therapy was 15.9 months with a range of 0.03 to 56.9 months. Median time to discontinuation was 12.3 months with a range of 0.03 to 45.7 months. The most common reason for treatment discontinuation was progression of disease, which was observed in 31.3% of patients. Discontinuation for time-limited therapy was attributed to 29.2% of patients. All other discontinuations (16.7%) were distributed between discontinuation due to adverse effects, unrelated death, or other reasons.

Conclusions: At the time of analysis, 50.5% of venetoclax therapy plans were discontinued. The most common causes for discontinuation were disease progression followed by planned discontinuation for time-limited therapy. Venetoclax is a well-tolerated oral chemotherapeutic agent that a majority of patients continue until progression or therapy discontinuation. Our study
demonstrated initial findings of persistence on venetoclax therapy when dispensed from a single Health-System specialty pharmacy. Limitations include limited external validity due to a single-center design and retrospective clinician documentation uses data not originally intended for research which can lead to obscurities.
Presenter Name: Rechenberg, Kathryn
Organization: Massachusetts General Hospital
Category: Oncology
Day | Session | Room | Time: Wednesday | 6 | Magnolia A | 3:45:00 PM

Authors: K. Rechenberg, E. Tavares, C. Bell, S. Luk; Massachusetts General Hospital, Boston, Massachusetts

Title: Therapeutic enoxaparin dosing in thrombocytopenic acute myeloid leukemia patients

Objectives: Cancer patients are at increased risk of thrombotic events often requiring therapeutic anticoagulation, yet disease state dynamics and chemotherapy can cause thrombocytopenia and bleeding. Leukemia patients are at greater risk of bleeding due to aggressive myelosuppressive chemotherapy. Managing therapeutic enoxaparin dosing in thrombocytopenic leukemia patients is challenging, often resulting in variable dose reduction strategies among providers and institutions. The purpose of this study was to assess the safety and effectiveness surrounding enoxaparin dose reductions in thrombocytopenic leukemia patients.

Methods: This retrospective study included acute myeloid leukemia (AML) patients admitted to a large academic medical center between August 2017 and August 2021 who required therapeutic enoxaparin and experienced an episode of thrombocytopenia lasting at least 72 hours. Patients with a CrCl < 30 ml/min, an active COVID-19 infection, and those placed on an intravenous heparin drip for > 72 hours were excluded. The primary outcome of this study was the 30-day incidence of thrombotic events from the first date of thrombocytopenia which prompted an enoxaparin dose reduction. Key secondary outcomes included the incidence of major and minor bleeding and enoxaparin dosing strategies.

Results: The frequency and number of thromboembolic and bleeding episodes that occurred during the 30-day study period will be presented. Enoxaparin dose adjustments during thrombocytopenia will be assessed.

Conclusions: It is anticipated that the results of this study will identify common therapeutic enoxaparin dosing strategies previously used in thrombocytopenic AML patients and the efficacy and safety of those dose reductions. These results may guide future anticoagulation dosing strategies in thrombocytopenic AML patients.
Objective: Risk of pulmonary toxicity when utilizing granulocyte colony-stimulating factors with bleomycin treatment

Methods: The electronic medical record system will be used to identify patients who have received bleomycin and which of those patients also received a granulocyte colony-stimulating factor (G-CSF). The following information will be collected: patient age, gender, dates of bleomycin administration, dose of bleomycin administered, dates of G-CSF administration, dose of G-CSF administered, and the diffusing capacity for carbon monoxide (DLCO) lab values. The patient's medical record will be reviewed to determine if there is documentation to indicate that the patient developed pulmonary toxicity while receiving bleomycin therapy. Review of the medical record will include provider documentation, pulmonary function tests, chest x-rays, and DLCO lab results. All data will be recorded without patient identifiers to maintain confidentiality. Data from all patients who received bleomycin will be reviewed by a team of clinicians to determine if the patient developed pulmonary toxicity.

Results: Patients who received bleomycin at Reading Hospital were reviewed from 1/1/19 to 8/30/21. Of the 25 patients included, 12 patients received a G-CSF in addition to bleomycin, and 13 patients received bleomycin alone. 4/12 patients (33.3%) who received a G-CSF plus bleomycin and 1/13 patients (7.7%) who received bleomycin alone experienced pulmonary toxicity. An evaluation on whether gender, cumulative bleomycin dose, baseline pulmonary disease, and smoking status contributes to bleomycin pulmonary toxicity will also be assessed.

Conclusions: It appears that there is an increased incidence of pulmonary toxicity in patients who receive a G-CSF in addition to bleomycin compared to patient who receive bleomycin alone. Each patient should be evaluated individually to determine if the risk of pulmonary toxicity...
with using a G-CSF outweighs the benefit of preventing neutropenia in patients receiving bleomycin.
Presenter Name: Simic, Slavka  
Organization: Englewood Hospital and Medical Center  
Category: Oncology  
Day | Session | Room | Time: Wednesday | 6 | Magnolia A | 4:30:00 PM

Authors: S. Simic, L. Boutillier, J. Regan, G. Joung; Englewood Hospital and Medical Center (EHMC), Englewood, New Jersey

Title: Evaluation of biosimilar utilization following implementation of oncology computerized physician order entry (CPOE) at a community hospital

Objectives: Since the enactment of the Biologics Price Competition and Innovation Act (BPCIA) in 2010, the Food and Drug Administration (FDA) has approved 34 biosimilars including 17 with oncologic indications for supportive care or cancer treatment. Despite endorsement from major oncology professional organizations including the American Society for Clinical Oncology (ASCO) and National Comprehensive Cancer Network (NCCN), oncology biosimilars face barriers which preclude their use. These barriers include hospital formulary restrictions, inequitable biologic rebate contracting practices, lack of prescriber education, and logistical challenges regarding implementation. The purpose of this study is to assess whether integration of preferred biosimilars into CPOE treatment plans resulted in an increase in biosimilar uptake.

Methods: This study has been approved by the EHMC Institutional Review Board. This retrospective chart review will evaluate medical records of patients who received reference or biosimilar drug administrations of rituximab, pegfilgrastim, trastuzumab, and bevacizumab between December 1, 2020 to December 31, 2021. The primary endpoint assessing number and percentage of monthly biosimilar administrations will be recorded. Secondary endpoints include proportion of payer rejections of biosimilar products, cost savings between reference versus biosimilar doses, and biosimilar utilization among new patients. Patients who switched between products due to an adverse event will also be studied to assess safety and immunogenicity risk.

Results: Utilization outcomes, cost savings, and safety data will be recorded and results will be presented.

Conclusions: It is anticipated that biosimilar administrations will increase following the transition from paper-based to electronic chemotherapy CPOE orders after June 2021. The expected results of this project will further support our institution's decision to make biosimilars our preferred formulary products and demonstrate a role for expanding the use of biosimilars to promote further cost savings.
Evaluation of fixed-dose versus body surface area-based leucovorin dosing in patients with colorectal cancer within a large health system

Objectives: A common chemotherapy regimen used in the treatment of colorectal cancer, which is the fourth most common cancer diagnosed in the United States, is FOLFOX (folinic acid, or leucovorin, fluorouracil, and oxaliplatin). As a result of leucovorin shortage, MedStar Franklin Square Medical Center (FSMC) has been using a fixed-dose leucovorin (700 mg) in colorectal cancer patients receiving FOLFOX for at least the past three years, while other sites within the system have continued to use the standard body surface area (BSA)-based leucovorin dosing (400 mg/m2). The primary objective of this study is to evaluate the effect of fixed-dose versus BSA-based leucovorin dosing on overall survival in patients with colorectal cancer within a large health system and the secondary objective is to assess the financial impact of the fixed-dose leucovorin dosing strategy.

Methods: This study is a retrospective chart review of patients who received leucovorin from January 1st, 2018 to March 30th, 2022 at FSMC and MedStar Georgetown University Hospital (GUH). Inclusion criteria include adult patients with a diagnosis of colorectal cancer with written informed consent; treatment naïve patients who received FOLFOX entirely on an outpatient bases with first cycle leucovorin given either as a flat dose (700 mg) at FSMC or BSA-based (400 mg/m2) at GUH. Exclusion criteria include previous therapy for colorectal cancer; patient who received an initial leucovorin dose other than 700 mg or 400 mg/m2 on their first cycle; patients with pancreatic cancer; brain metastases; no documented informed consent. Descriptive statistics will be used to interpret the results.

Results: Treatment outcomes such as overall survival and the financial impact between the two dosing strategies will be assessed and results will be presented.

Conclusions: It is anticipated that this project will demonstrate that the two leucovorin dosing strategies will have no differences in the overall survival of patients with colorectal cancer. Furthermore, it is anticipated that the fixed-dose leucovorin strategy will be more cost effective.
Tu, Sydney

Evaluation of inpatient use of leuprolide in oncology patients

Conference Abstracts
May 16-18, 2022

Presenter Name: Tu, Sydney
Organization: Massachusetts General Hospital
Category: Oncology
Day | Session | Room | Time: Wednesday | 6 | Magnolia A | 3:30:00 PM

Authors: Sydney Tu, Jessie Signorelli, Christopher Bell
Title: Evaluation of inpatient use of leuprolide in oncology patients

Objectives: In premenopausal females undergoing chemotherapy for cancer, thrombocytopenia and coagulopathies increase the risk of menorrhagia.1 Given this risk, premenopausal females are often treated with preventative menstrual suppression using leuprolide, a gonadotropin-releasing hormone agonist, every 1 to 3 months.1 Additionally, leuprolide is used as palliative treatment of advanced prostate cancer. The purpose of this evaluation is to characterize inpatient leuprolide utilization and to determine if opportunities exist to safely defer leuprolide administration to the outpatient setting to decrease cost.

Methods: This was a retrospective, single center cohort analysis that included admissions from February 1, 2017, to November 30, 2020. Leuprolide administration in premenopausal females and males with prostate cancer were included in the analysis. The primary endpoint was appropriate use of inpatient leuprolide defined by an algorithm created for this evaluation. Appropriate use included patients with an unplanned admission for newly diagnosed cancer requiring leuprolide administration prior to chemotherapy initiation. Appropriate dosing is deemed as the 1-month dose (3.75 mg). Administration during planned admissions will be deemed inappropriate. Unplanned admissions where patients are anticipated to have an inpatient stay less than seven days will be deemed inappropriate. Secondary endpoints include the estimated cost-savings potential of deferring inpatient maintenance leuprolide administration to the outpatient setting.

Results: Fifty randomly selected patients were analyzed. The 1-month dose was administered appropriately in the inpatient setting for 11 (22%) patients. For the remaining 39 (78%) patients, 3 (6%) doses were administered appropriately in the inpatient setting but were the 3 or 6-month dose ($10,679 potential savings if administered 1-month dose). Nineteen (38%) doses should have been deferred to the outpatient setting but used the preferred 1-month dose for inpatient administration. Seventeen (34%) doses should have been deferred to the outpatient setting and used the 3 to 6-month dose. Based on average wholesale price, a potential savings of $154,134 was found if non-acute use leuprolide doses were deferred to the outpatient setting. If all patients who received either the 3 or 6-month doses received the 1-month dose, there could have been a potential savings of $87,331.
**Conclusions:** This small cohort illustrated 78% of patients were inappropriately administered leuprolide (based on setting and dosing). Therefore, it appears that there is a significant cost-savings potential if patients were deferred to the outpatient setting to receive their monthly leuprolide injection.
Conference Abstracts  
May 16-18, 2022  

Presenter Name: Vess, Halley  
Organization: Virginia Hospital Center  
Category: Oncology  
Day | Session | Room | Time: Tuesday | 3 | Wild Rose A | 1:45:00 PM

Authors: H. Vess, M. Shah, B. Wolford, and M. Johnson  
Title: Evaluation of appropriate antibiotic therapy in febrile neutropenic patients based on order-set utilization in a community hospital setting

Objectives: Febrile neutropenia is an oncologic emergency that can lead to sepsis and death. Although the algorithm for antibiotic selection in febrile neutropenia appears straightforward, the challenge of recognition of this patient population in the emergency department can lead to complex prescribing. This study aims to investigate the appropriate selection of broad-spectrum antibiotic therapy in febrile neutropenic patients with and without a beta-lactam allergy.

Methods: This study was a single center, retrospective chart review of patients 18 years and older who were admitted to the hospital between June 1, 2019 and August 31, 2021 with a diagnosis of febrile neutropenia (defined according to the National Comprehensive Cancer Network (NCCN) guidelines). The primary outcome was to evaluate the utilization of the febrile neutropenia order-set in order to assess antibiotic selection. The secondary outcomes included appropriate use of the febrile neutropenia order-set, time to administration of first antibiotic, hospital length of stay, unit of stay, and appropriate granulocyte colony-stimulating factor dose. The data was analyzed using Excel averages and all data was stored confidentially. This study was approved by the Institutional Review Board of Shenandoah University.

Results: A total of 78 patients met the inclusion criteria for this study. Of the 78 patients, 9 were excluded due to primary etiologies other than cancer. Eight patients reported an allergy to penicillin and one patient reported an allergy to cephalosporins. For the primary outcome of utilization of the febrile neutropenia order-set, the order set was not used in any of the 69 patients. An emergency department specific order-set labelled “ED Sepsis” was used 26% of the time (n=18). The antibiotics ordered were as follows: vancomycin 82.6% (n=57), cefepime 63.8% (n=44), meropenem 21.7% (n=15), gentamicin 8.7% (n=6), piperacillin-tazobactam 10.1% (n=7), ceftriaxone 2.9% (n=2), and aztreonam 1.4% (n=1). Of the 57 patients that received vancomycin, 18 were determined to be appropriate. For the secondary outcomes, the average time to first antibiotic was 96.18 minutes. The average length of stay was 6 days. Patients were transferred to the oncology unit 60.9% of the time (n=42). Of the 34 patients that received a granulocyte colony-stimulating factor, the correct dose was administered 82.4% of the time (n=28).
Conclusions: The addition of vancomycin and timing to first antibiotic appear to be points of improvement for our hospital febrile neutropenia process. The results of this study also show the potential for improved granulocyte colony-stimulating factor dosing with inclusion in the order set. The results of this project demonstrate the need for further education on available order-sets in the emergency department setting.
**Title:** Evaluation of the occurrence and risk factors for spontaneous cytomegalovirus clearance after low level reactivation using a pre-emptive treatment threshold of 4,000 IU/mL in allogeneic hematopoietic cell transplant recipients

**Objectives:** Cytomegalovirus (CMV) can be a serious complication after allogeneic hematopoietic cell transplant (HCT). Many patients spontaneously clear low-level CMV viremia without the need for treatment, but there is no established universal threshold for pre-emptive therapy and many centers utilize different strategies based on risk factors. The primary objective of this study is to determine the rate of spontaneous clearance of low level (<4,000 IU/mL) CMV reactivation in allogeneic HCT recipients. Secondarily this study aimed to identify and evaluate factors associated with spontaneous clearance and to evaluate the occurrence of subsequent CMV organ disease in patients with low level CMV reactivation with deferred treatment.

**Methods:** This institutional review board-approved, retrospective, chart review included consecutive allogeneic HCT recipients at WVU Medicine from 2009-2021. Inclusion criteria was anyone greater than or equal to 18 years of age with a history of allogeneic HCT with positive CMV PCR results <4,000IU/mL for the first episode of CMV reactivation, and not initiated on pre-emptive treatment. This study excluded any patients that received letermovir prophylaxis.

**Results:** Results are in progress and will be finalized and reported at the meeting.

**Conclusions:** Conclusion is pending
Presenter Name: Wright, Tonya  
Organization: MedStar Washington Hospital Center  
Category: Oncology  
Day | Session | Room | Time: Tuesday | 3 | Wild Rose A | 1:00:00 PM

Authors: Tonya Wright, PharmD and Quan Li, PharmD, BCOP, BCPS, DPLA

Title: Evaluation of the Safety of the New Alcohol Containing Cyclophosphamide Formulation

Objectives: The objective of this study is to determine if the new formulation of cyclophosphamide, which contains alcohol, has more central nervous system side effects, liver function changes, delays in treatment (more than 7 days), or treatment related hospitalizations compared to the old formulation of cyclophosphamide.

Methods: This study is a multicenter, retrospective, chart review of oncology patients who received cyclophosphamide from April 1, 2021 to December 31, 2021. The charts of oncology patients who have received both the lyophilized powder formulation as well as the liquid alcohol containing formulation will be evaluated. Exclusion criteria are patients less than 18 years of age, those with advanced liver damage, liver or brain metastases, or liver cancer. The primary endpoint will be changes to liver function tests and central nervous system side effects that happen within 21 days of the cyclophosphamide dose. AST and ALT baseline data will be obtained from the chart and will be evaluated with each administration of cyclophosphamide to determine if there are significant changes. Central nervous system side effects include drowsiness, memory impairment, slurred speech, and headaches. This data will be collected as self-reported by the patients when asked by the nurse at the beginning of each visit. Secondary endpoints are treatment delays of more than 7 days or treatment related hospitalizations. Inclusion criteria are patients who have received either formulation of cyclophosphamide.

Results: The total number of participants in the lyophilized powder group was 110 and the alcohol group was 137. The average age of all participants was 59.4 years. The lyophilized group was predominately white, 55.5%, and the alcohol group was predominately Black, 63.5%. Both groups are predominately female, 66.4% for the lyophilized group and 84.7% for the alcohol group. Final analysis is pending.

Conclusions: It is anticipated that this project will demonstrate that the new formulation of cyclophosphamide does not have more side effects than the older formulation and there should not be any hesitation in using the new formulation.
Conference Abstracts
May 16-18, 2022

Presenter Name: Yogarajah, Umesh
Organization: The University of Vermont Medical Center
Category: Oncology
Day | Session | Room | Time: Tuesday | 3 | Wild Rose A | 12:45:00 PM

Authors: U. Yogarajah, R. Cade, A. Kennedy, B. Tompkins, F. Khan, & S. Ahmed; University of Vermont Medical Center, Burlington, Vermont

Title: Evaluation of mortality risk in cancer patients with antibiotic use within 60 days of initiating an immune checkpoint inhibitor

Objectives: Non-small cell lung cancer (NSCLC), renal cell carcinoma (RCC), and melanoma have been classically difficult to treat, and traditional chemotherapeutic options have been hampered by significant toxicities and limited efficacy. Immune checkpoint inhibitors (ICI) represent a novel treatment option and have translated to improved survival for many patients. Recent studies have identified a negative correlation between antibiotic use and survival in patients with cancer receiving ICI. It is hypothesized that antibiotics affect gut microbiota which is important for regulation of the immune system, ultimately affecting responses to ICI-therapy. Our goal is to assess whether antibiotic use within 60 days of initiating ICI affects mortality in non-small cell lung cancer, renal cell carcinoma, and melanoma patients treated at our institution.

Methods: This is a single institution retrospective cohort chart-review study conducted at the University of Vermont Medical Center. The study consists of approximately 270 patients with stage IV NSCLC, RCC, and melanoma that had received ipilimumab, pembrolizumab, nivolumab, atezolizumab, avelumab or durvalumab from 1/1/2016 to 11/30/2019. Patients who received antibiotics within 60 days prior to receiving their first dose of ICI were identified using automatic electronic medical record search. They were compared to patients who did not receive antibiotics within 60 days prior to their first dose of ICI. The primary outcome was median 2-year OS in NSCLC patients and 3-year median OS in RCC and melanoma patients. Secondary outcomes include median progression free survival and time to subsequent treatment. Overall survival and median progression-free survival were analyzed using hazard ratios on a Kaplan-Meier curve, while time to subsequent treatment were analyzed using ANOVA.

Results: According to the preliminary results, NSCLC patients who received antibiotics within 60 days of initiating antibiotics had a hazard ratio for death of 1.94 [95% CI 1.28-2.91; p=0.001]. 3-year OS for RCC and melanoma had a hazard ratio for death of 1.05 [95% CI 0.45-2.49; p=0.902]. Complete primary outcome and secondary outcome analysis is pending and will be available for the Eastern States Residency Conference.
Conclusions: In conclusion, based on the preliminary data analysis there appears to be a significantly increased hazard of death within 2-years for NSCLC patients who received antibiotics within 60 days of starting ICI therapy compared to patients who did not receive antibiotics. RCC and melanoma data were combined due to a smaller sample size, but the use of antibiotics did not significantly affect the 3-year OS. This study adds to the corpus of literature that suggest a negative correlation between antibiotic use and survival in patients with cancer treated with ICI.
Addair, Marla

A retrospective evaluation of pharmacist prescribed naloxone rate upon release of novel prescribing pathway in a level 2 veterans affairs medical center

Authors: B. M. Addair, C. Goode, P. Huffman; Veterans Affairs Medical Center (VAMC), Beckley, West Virginia

Title: A retrospective evaluation of pharmacist prescribed naloxone rate upon release of novel prescribing pathway in a level 2 veterans affairs medical center

Objectives: Objective: The purpose of this study was to evaluate the rate of naloxone prescribing by pharmacists in relation to the release of a Naloxone Prescribing Pathway (NPP) that communicates the facility adoption of a network approved naloxone standing order protocol and outlines how a pharmacist should proceed in prescribing and issuing naloxone under the protocol. We predicted the release of the NPP would increase the rate of naloxone prescribing by pharmacists as it provided a facility specific reference guide and was authored and released by local pharmacy leadership.

Methods: Methods: A list of the dispensed, outpatient naloxone prescriptions at the facility was pulled for dates ranging four months before and after the NPP release. The data was sorted into two categories: pharmacist prescriber and non-pharmacist prescriber. The percent of pharmacist prescribed Naloxone before and after the NPP was compared.

Results: Results: The percentages of pharmacist prescribed naloxone before and after release of the NPP were 28% (n= 92) and 29% (n= 162), respectively. The rate of naloxone prescribing by pharmacists at the facility increased by 76% (n =70) after the NPP implementation.

Conclusions: Conclusion: After the release of the NPP, the rate of pharmacist prescribed Naloxone and number of unique pharmacist prescribers at the medical center increased.
Conference Abstracts
May 16-18, 2022

Presenter Name: Adjin-Tettey, Nadia
Organization: Frederick Health Hospital
Category: Pain Management/Palliative Care
Day | Session | Room | Time: Tuesday | 4 | Magnolia D | 4:15:00 PM

Authors: N. Adjin-Tettey, L. Lee

Title: Evaluation of scheduled non-narcotic pain medications in reducing opioid use for post-operative pain management in Cesarean section patients

Objectives: Opioid overuse post Cesarean section (C-section) is a common and increasing issue in our community, and studies have shown that 1 in 300 women who use opioids postpartum go on to become addicted. Across the country, multimodal pain management strategies have been implemented with success to promote enhanced recovery after surgery in C-section patients. The purpose of this study is to assess the impact of using scheduled non-narcotics on reducing the use of opioids in post C-section patients, including those with substance use disorders.

Methods: Medical records of patients undergoing C-sections will be reviewed before and after the implementation of order sets with acetaminophen 650 mg administered concurrently with ibuprofen 600 mg every 6 hours for primary pain management, with opioids to be given as needed for refractory pain. Patients' total use of opioids, including post anesthesia care unit (PACU) opioid use will then be assessed. The total use of post C-section opioids amongst all the patients will be converted to morphine equivalents. Patients 18 years and older who underwent a C-section during the study period (August 2021 to April 2022) will be included in the study. Patients with substance use disorder, defined as patients with a positive urine toxicology screen for amphetamines, opiates, benzodiazepines, cocaine, cannabis, methadone, oxycodone, or phencyclidine, or patients on buprenorphine, methadone or buprenorphine/naloxone will be studied as a subset in this research. Patients allergic to NSAIDs or acetaminophen, or with any contraindications to NSAIDs or acetaminophen, or patients who refuse the study medications will be excluded. A Mann Whitney U test will be used to analyze the statistical difference.

Results: This is a research in progress, and the data collection for the post-implementation group is ongoing. Baseline characteristics in the pre-implementation group show the median age of patients was 32 years, with 11 patients with substance use disorder. The median opioid use in the pre-group was 45 morphine milligram equivalents (MME), and in patients with substance use disorder, the median opioid use was 60 MME.

Conclusions: It is anticipated that this study will reveal a reduction in the use of opioids in postpartum patients who received scheduled non-opioid medications post C-section.
Characterization of outpatient gabapentinoid prescribing for pain

Objectives: The American Diabetes Association and American Academy of Neurology Guidelines recommend minimum effective doses of gabapentin and pregabalin for the treatment of diabetic peripheral neuropathy (DPN); however, studies of real-world gabapentinoid dosing demonstrate that the recommended dose targets are frequently not met. While specific guidance is lacking for other types of neuropathic pain, these DPN dose targets are frequently extrapolated across pain syndromes in clinical practice. This study aims to characterize gabapentinoid prescribing patterns in patients receiving primary care at the Johns Hopkins Outpatient Center.

Methods: A retrospective chart review was conducted in adult outpatients who attended the Johns Hopkins Outpatient Center Internal Medicine Clinic or Johns Hopkins Outpatient Center Medical Clinic who received at least one prescription for gabapentin or pregabalin between October 1, 2017 and October 1, 2020 and did not receive a gabapentinoid prescription for 6 months prior to the index date. Patients were identified via our institution’s electronic medical record (Epic) and prescription data through Surescripts and observed for 12 months after the gabapentinoid index date. Outcomes were baseline characteristics and demographics of patients, percentage of patients that reached the minimally effective dose of gabapentinoid, mean maximum dose of gabapentinoid, mean time to maximum dose of gabapentinoid, mean proportion of days covered, and comparisons between patients prescribed optimal versus suboptimal doses of gabapentinoid.

Results: A total of 1,221 patients were included in the study with 1,079 (88.4%) prescribed gabapentin and 142 (11.6%) prescribed pregabalin. The median (IQR) age was 58 (22) years. A total of 885 (72.5%) received a prescription for another analgesic agent over the 12-month review period with a median (IQR) number of 4 (10) prescriptions per patient per year. The most commonly prescribed additional analgesic agents were opioids, serotonin and norepinephrine reuptake inhibitors, and tricyclic antidepressants with a median number of 3 prescriptions per patient per year for each class. A total of 194 patients (15.9%) had a chronic pain or palliative care referral. Only 11 patients (0.9%) had an FDA approved indication for gabapentin or pregabalin. The dosing characteristics of gabapentinoids will be determined and presented.
Conclusions: It is anticipated that this project will demonstrate a role for optimization of gabapentinoid dosing to ensure an adequate trial at the minimum effective dose is completed according to guidelines.
Addressing polypharmacy in palliative care using the VIONE polypharmacy review

**Objective:** Polypharmacy, the use of multiple medications by patients, is a common chronic problem in older adults. It is associated with increased risks for adverse drug events, drug-drug interactions, challenges with adherence, and increased costs. Deprescribing is an individualized proactive process of comprehensively reviewing a patient's medication list to discontinue or reduce the dose of medications, with the goal of reducing polypharmacy-related adverse events. The VIONE deprescribing tool is a method to categorize medications into the following categories to highlight opportunities for deprescribing: Vital, Important, Optional, Not indicated, and Every medication has a diagnosis or indication.

**Methods:** The palliative care team identified patients with less than 1 year prognosis with a primary diagnosis of advanced cancer, advanced dementia, amyotrophic lateral sclerosis (ALS), or chronic obstructive pulmonary disease (COPD). The palliative care team was provided deprescribing education by a pharmacist. Eligible patients' medication lists were reviewed and sorted into VIONE categories and patients and/or caregivers were contacted for shared-decision making about deprescribing interventions. If the patient and/or caregiver were amenable to deprescribing recommendations, the prescriber was notified of recommendations or palliative care discontinued medications for medications prescribed by palliative care. Information collected includes patient demographics, palliative care team member contacting patient, primary diagnosis, number of medications at time of contact, number of deprescribing opportunities identified and recommended, number of interventions implemented by a non-palliative care team member within two weeks of contact, and number of interventions implemented by a palliative care team member.

**Results:** The number of deprescribing interventions will be recorded and results will be presented.

**Conclusions:** It is anticipated that this project will demonstrate the role for shared-decision making deprescribing efforts in the palliative care setting to reduce risk of polypharmacy-related adverse events.
The impact of opioid tapering and discontinuation on suicide and overdose risk in the Veteran population: a medication use evaluation

Objectives: The opioid epidemic continues to be a public health concern in the United States. In addition, the rate of opioid overdose and suicide is increasing in the United States. The rate of suicide and overdose is higher in the Veteran population as compared to the general US population. In 2013 the Department of Veterans Affairs (VA) implemented the Opioid Safety Initiative (OSI). The aim of the OSI was to provide safe and effective use of opioid therapy. In 2017 the VA/Department of Defense (DoD) published clinical practice guidelines for the Management of Opioid Therapy for Chronic Pain. There has been an association made between opioid discontinuation and suicide/overdose rates within the VA since implementation of the OSI. Currently the specific risk factors for suicide/overdose in this patient population is not well understood and further information is needed to better understand the correlation. The goal of this project is to evaluate potential factors that contribute to the association between opioid therapy taper or discontinuation and suicide and/or overdose in the Veteran population.

Methods: This quality improvement project is being conducted at the Lebanon VA Medical Center. This project was reviewed by the local committee in accordance with local policy for quality improvement projects. This will be a retrospective chart review where data will be collected from the Computerized Patient Record System (CPRS). Patients will be included in the review if initially on opioid MEDD >90 prior to opioid taper/discontinuation during fiscal year 2017-2020 and receiving opioids for chronic non-cancer pain. Exclusion criteria includes palliative/hospice care or active cancer treatment, opioid taper management by non-VA provider, patient stopped receiving opioids due to being lost to follow-up, or patient resides in a VA long-term care facility. Data collection will include medication and diagnostic history, demographics, taper initiation and process, details of follow-up and risk assessment, and outcomes of opioid taper or discontinuation.

Results: The outcomes related to opioid tapering and/or opioid discontinuation will be reported. The factors associated with the opioid taper process such as taper period, taper strategy, monitoring, etc. will be reported.
Conclusions: The information from this project will be aggregated nationally with other VA facilities for further analysis. The impact of this project could provide factors that are associated with suicide and overdose risk in the Veteran population after an opioid taper or discontinuation.
Objectives: Chronic pain is a common and often debilitating condition, with National Health Interview Survey (NHIS) data showing that approximately 20.4% of adults in the United States suffer from chronic pain and 7.4% of adults suffer from chronic pain that frequently limits daily activities. Among the various treatments for chronic pain, medical cannabis continues to be a popular option with the general population despite the limited and conflicting evidence pertaining to the substance’s analgesic and opioid-sparing properties. The objective of this project is to identify potential trends regarding cannabis use and opioid utilization, specifically in a veteran population prescribed chronic opioid therapy.

Methods: A retrospective chart review of a cohort of veterans prescribed chronic opioid therapy with concurrent cannabis use between January 1st, 2018, to August 31st, 2021, was performed. The patient list for this project was created by combining two facility database cohorts consisting of veterans prescribed chronic opioid therapy at the facility and veterans with two urine drug screens (UDS) positive for THC (UDSs had to be at least 365 days apart +/- 90 days). Veterans were excluded from the project if they have had an active diagnosis of opioid use disorder, received prescription opioids outside of the medical center, or were on a formulation of an opioid analgesic not FDA-approved for pain (ex. buprenorphine/naloxone sublingual film). Veterans' charts were reviewed for the morphine milligram equivalence dose (MEDD) at the time of each annual UDS (positive for THC) and the mean change in MEDD for each veteran during the project timeframe was calculated.

Results: Data collection for the project is currently ongoing. Demographic data and endpoint results will be presented utilizing descriptive statistics.

Conclusions: It is anticipated that the results of this project will help identify potential trends regarding cannabis use and opioid utilization among veterans at the facility. This in turn, will allow the project managers to determine whether patient or provider education regarding cannabis is needed to help optimize chronic pain management for veterans receiving care at the medical center.
Conference Abstracts  
May 16-18, 2022

**Presenter Name:** Gaynor, Kaitlyn  
**Organization:** Temple University Hospital  
**Category:** Pain Management/Palliative Care  
**Day | Session | Room | Time:** Wednesday | 6 | Magnolia B | 4:00:00 PM

**Authors:** Kaitlyn Gaynor, PharmD; Laura Mentzer, PharmD, BCPS, BCCCP; Christina Rose, PharmD, BCCCP; Joseph D'Orazio, MD, FAAEM, FACMT

**Title:** Evaluation of the use of medications for opioid use disorder (MOUD) in the inpatient setting at a community hospital

**Objectives:** In 2018, an estimated 10.3 million individuals in the United States misused opioids. Inadequate management of opioid use disorder (OUD) during hospitalization may lead to patients leaving against medical advice (AMA), causing increased readmissions, treatment failure, and resistant organisms. The objectives of this study was to compare discharge outcomes of patients with OUD, evaluate efficacy and safety of current strategies to manage OUD, and assess doses patients received from methadone, buprenorphine, and opioid agonists initiated during a hospital stay.

**Methods:** In this retrospective chart review, patients were included if they had an International Classification of Diseases (ICD) code in category F11 all opioid related disorders, admitted for longer than 24 hours, and admitted to Temple University Hospital Jeanes Campus from June 1, 2020 through June 1, 2021. Any patient < 18 years old, > 90 years old, pregnant, unable to tolerate oral medications, intubated/sedated, or continuing outpatient medications for opioid use disorder (MOUD) were excluded. The primary endpoint assessed rates of AMA discharge in patients treated for OUD with MOUD. Secondary endpoints included 30-day and 90-day readmission rates, frequency of methadone, buprenorphine, opioid agonists, non-opioid adjunctive agents used, mean doses of methadone, buprenorphine and opioid agonists in morphine milligram equivalents (MME), frequency of inpatient naloxone administration, hospital length of stay, and discharge disposition. To analyze this date, descriptive analysis and chi-square tests were performed, respectively.

**Results:** AMA rates as well as readmission rates within 30 and 90 days will be recorded in all patients who were diagnosed with OUD. Reported secondary outcomes include MME each patient received during their inpatient stay, doses of MOUD agents utilized, hospital length of stay, and discharge disposition. Safety events will also be reported through the amount of patients utilizing the opioid reversal agent naloxone and the patient's vitals at the time of administration.

**Conclusions:** It is anticipated that the results of this project will provide the addiction medicine community more information regarding the treatment of patients with OUD in the inpatient setting.
setting. From these findings, education regarding the OUD patient population and proper treatment guidance will be provided to help reduce AMA rates and increase completion of care with the patient's primary diagnosis while inpatient.
**Title:** Acute pain management for patients maintained on oral buprenorphine for medication-assisted therapy

**Objectives:**

The authors of this study hypothesized that, for patients maintained on oral buprenorphine therapy and admitted for a procedure or acute pain management, a difference in daily average morphine milligram equivalents (MME) would be dependent upon the daily dose of buprenorphine received while inpatient or in observation. Thus, the primary objective was to evaluate daily average MME administered between patients continued on buprenorphine at a dose greater than 12 mg per day compared to less than or equal to 12 mg per day. The key secondary objective was to evaluate daily average pain scores between study groups.

**Methods:**

Retrospective chart review was performed of patient encounters at Penn Medicine Lancaster General Hospital between January 2017 and November 2021. The primary outcome was daily average MME administered to those continued on buprenorphine greater than 12 mg/day compared to less than or equal to 12 mg/day. Patients that had therapy held on admission for greater than or equal to 48 hours were placed in the less than or equal to 12 mg/day study group. Inclusion criteria were patients greater than or equal to 18 years of age, maintained on a form of oral buprenorphine therapy for at least one month prior to hospitalization for opioid use disorder or history of substance abuse, and diagnosis or procedure that required acute pain management. Key exclusion criteria were buprenorphine maintenance therapy for pain management and hospital stay less than 24 hours. Target sample size was calculated to be 78 patients total (39 patients in each group) in order to provide a power of 80% with an alpha of 0.05, assuming a minimum difference of 90 MME between study groups with a standard deviation of 140 MME. Analysis of MME and pain scores between groups were compared via Mann-Whitney test.

**Results:**

Seventy-six (76) patients total were included; 38 patients per study group. Baseline characteristics were similar between groups; however, the group that received greater than 12 mg/day was statistically younger (median [MD] years: 37 vs 47; p =0.02). For the primary outcome, daily average MME were similar between groups, although a trend to less MME requirements in the greater than 12 mg/day group was observed (MD: 7.5 vs 10.6; 95% confidence interval [CI], -11.1 to 2.5; p =0.341). Moreover, total MME administered were similar
but trended to less use in the greater than 12 mg/day group (MD: 36.8 vs 76.3; 95% CI, -69 to 6; p =0.274). For the secondary outcome, daily average pain scores were similar between groups (MD: 5.8 vs 5.0; 95% CI, -0.5 to 1.6; p =0.388). In a secondary analysis which compared continuation of buprenorphine throughout hospitalization (n =60) versus temporary hold (n =16), daily average MME (MD: 6.8 vs 35.7; 95% CI, -42.5 to -6.7; p <0.001) and total MME (MD: 30 vs 325.8; 95% CI -403 to -37.5; p <0.001) were significantly less in those that received buprenorphine. Daily average pain scores were similar between those that had therapy continued compared to held.

**Conclusions:** Interpretation of study results and conclusions will be presented.
Efficacy of the Utilization of Ketamine for Pain Management in Critically Ill Adult Patients

Method:

A multi-center retrospective chart review was conducted and included adult patients who received at least one dose of ketamine for pain management between January 1, 2020 and August 1, 2021 in an intensive care or emergency medicine setting across four hospitals within the LifeBridge Health system. A medication administration report was obtained to identify eligible patients and data was collected through the patient's electronic health record. The data collected included patient demographics, reason for hospitalization, comorbidities or relevant past medical history, dose of ketamine ordered/administered, adjunctive pain medications, opioid use before and after ketamine initiation, pain scores before and after ketamine initiation, and reported adverse effects.

Result:

A total of 34 patients were identified who received ketamine for the indication of pain. Patient ages ranged from 20 to 79 years, 19 patients received ketamine bolus doses in the ED, and 15 patients received ketamine continuous infusions in the ICU. Bolus doses ranged from 0.1-0.5mg/kg with the most common dose being 0.1 mg/kg (47%). Continuous infusion doses ranged from 0.23 mg/kg/hr to 16 mg/kg/hr and were most commonly ordered for "pain/sedation". Of the patients receiving a continuous infusion, 10 were hospitalized for COVID infection. No adverse effects following ketamine administration were observed.

Conclusion:

Ketamine use within LifeBridge Health varied between hospitals and unit. Bolus doses were only seen in the ED while infusions were only seen in the ICU. The most common bolus dose was 0.1 mg/kg. Infusions varied greatly between 0.23 mg/kg/hr up to 16 mg/kg/hr. Efficacy of ketamine for pain control was unable to be determined due to missing follow-up pain scores. At the conclusion of this project, a standardized ordering protocol was created for pain management.
management using ketamine with the intent of standardizing the dosing practices within this health system.
**Presenters Name:** Herod, Kyle  
**Organization:** Portsmouth Regional Hospital  
**Category:** Pain Management/Palliative Care  
**Day | Session | Room | Time:** Wednesday | 6 | Magnolia B | 3:30:00 PM

**Authors:** Kyle Herod, PharmD Christopher Devine, PharmD, BCCCP, BCPS  
**Title:** Impact of Various Pain Management Modalities in Hospitalized Adults with Multiple Rib Fractures

**Objectives:** Rib fractures account for approximately 66% of thoracic traumas. However, despite the frequency, there is a lack of consensus regarding the recommended management. Studies are limited regarding the appropriate use of pain management in patients with thoracic trauma. Complications such as increased hospital and ICU length of stay, mechanically ventilated days, and pneumonia can arise from inadequately treated pain from rib fractures. This retrospective cohort study examined the use of different pain management modalities and the subsequent patient outcomes. Based on the results, the current rib fracture clinical practice guideline could be modified or improved.

**Methods:** A chart review of patients admitted by the Trauma service with multiple rib fractures from January 2021 to August 2021 and then September 2021 to February 2022 was conducted. Information was collected regarding specific pain management methods and complications associated with the progression of treatment and the hospital stay. Data was de-identified and kept securely. Patients included in this study were adults ≥ 18 years old presenting with ≥ 3 rib fractures. Exclusion criteria included subjects with <3 broken ribs, severe altered mental status where pain could not be assessed, and hemodynamic instability. The use of different analgesia modalities was compared to each other based on specific patient outcomes. The primary outcome was the percentage of patients with elevated, validated pain scores despite treatment. Secondary outcomes include duration of mechanical ventilation, length of hospital stay, length of ICU stay, and development of pneumonia. The safety endpoint was the number of administrations of naloxone. Data was analyzed according to the type of analgesia that was used (epidural, multimodal analgesia, as needed vs scheduled).

**Results:** The number and percentage of patients with elevated pain scores and the use of multimodal pain management (lidocaine patches, methocarbamol, etc) will be recorded and presented.

**Conclusions:** It is anticipated that this project will highlight the use of multimodal analgesia in patients with multiple rib fractures at Portsmouth Regional Hospital. It is anticipated that there will be a greater proportion of patients started on multimodal analgesic more recently.
Development of an inpatient opioid stewardship metric dashboard

Conference Abstracts
May 16-18, 2022

Presenter Name: Kasberg, Brandon
Organization: The Johns Hopkins Hospital
Category: Pain Management/Palliative Care
Day | Session | Room | Time: Poster

Authors: B. Kasberg, J. Waldfogel, L. Jablonski, O. Berger, J. Smith, T. Woodroof, I. Watt, S. Nesbit; The Johns Hopkins Hospital, Baltimore, Maryland

Title: Development of an inpatient opioid stewardship metric dashboard

Objectives: The persistent opioid epidemic has triggered healthcare regulatory and quality bodies to place a greater focus on opioid utilization. Many health systems lack the ability to track specific inpatient stewardship metrics to monitor performance. The goal of this project is to generate an inpatient opioid stewardship metric dashboard to collect data to monitor performance for regulatory and quality purposes.

Methods: An environmental scan of regulatory and quality requirements, and current literature was completed to identify inpatient opioid metrics, which were grouped into four categories: Opioids, Harm Reduction, Opioid Use Disorder, and Pain Assessment and Management. A modified Delphi Method will be used to gain consensus within an interdisciplinary stakeholder group on appropriate metrics for inclusion. A SWOT analysis will be completed to assess feasibility and determine an ideal reporting platform.

Results: Sixty-eight metrics were included for evaluation and distributed to participants from six hospitals within one health system. Initial survey results will be reported. Further results regarding the prioritized metrics anticipated May 2022.

Conclusions: It is anticipated that this project will identify which opioid stewardship metrics are deemed most impactful by an interdisciplinary team and also feasible to include in a metric dashboard, thus leading to developing an inpatient opioid stewardship metric dashboard.
**Authors:** Kuhn M, Bystrak T, Martinez L

**Title:** Identification and risk mitigation of veterans on gabapentinoids at high risk for respiratory depression

**Objectives:** Gabapentinoids (gabapentin, pregabalin) are indicated for use in patients experiencing neuropathic pain or seizure. Gabapentinoid use has steadily increased in the United States over the past decade, primarily due to increased utilization of non-opioid medications for pain management. Gabapentinoids have generally been considered a safer alternative to opioids; however, data increasingly shows that gabapentinoid use still comes with significant safety risks. Based on the results of several studies, the Food and Drug Administration (FDA) released a warning in 2019 for serious respiratory adverse events in patients using gabapentinoids in combination with central nervous system (CNS) depressants and/or in patients with comorbid respiratory disease. Retrospective studies reviewing opioid related death have concluded that concurrent gabapentinoid use with opioid correlated to higher risk for respiratory depression resulting in death than opioids alone. Due to concurrent opioids and gabapentinoids posing the greatest safety risk, patients receiving this combination were identified for inclusion in this quality improvement project.

**Methods:** This was a single-centered, retrospective chart review of veterans receiving gabapentinoids in combination with CNS depressant medications. The primary objective of this study was to identify veterans prescribed gabapentinoids at risk for respiratory depression, mitigate risk through chart review and provide recommendations. Veterans were included if they had an active outpatient prescription for a gabapentinoid from the CVAMC and were also prescribed an opioid and/or benzodiazepine from any outpatient source. Veterans were excluded if they received a gabapentinoid from a non-VA source or had an order for a gabapentinoid that had never been filled.

**Results:** The recommendations made for identified Veterans will be assessed and trends will be reported.

**Conclusions:** It is anticipated that this project will improve risk mitigation for respiratory depression in selected patients prescribed a gabapentinoid. In addition, this project is anticipated to identify common strategies that can be used by providers to mitigate risk for all patients prescribed a gabapentinoid.
Conference Abstracts  
May 16-18, 2022

Presenter Name: May, Christopher
Organization: UMass Memorial Medical Center (UMMMC)
Category: Pain Management/Palliative Care
Day | Session | Room | Time: Wednesday | 6 | Magnolia B | 3:00:00 PM

Authors: C. May, E. Isaac, I. Asoh; UMass Memorial Medical Center (UMMMC), Worcester, Massachusetts

Title: Patient-controlled analgesia (PCA) prescribing at an academic medical center

Objectives: Optimizing pain regimens can be challenging in the postoperative, critically ill, cancer and sickle cell populations given the wide variability in patients' interpretation of pain, opioid tolerance, types of injury, and underlying conditions. Multimodal analgesia as a strategy to reduce opioid requirements through non-pharmacologic therapy and non-opioid analgesics has gained wide adoption, however opioids are the mainstay of acute pain management in these patient populations. Patient-controlled analgesia (PCA) allows patients to safely self-administer set doses of opioids with an aim to provide adequate pain control while minimizing adverse events. Evidence supports improved pain control and patient satisfaction with PCAs compared to as-needed nurse administered analgesia. This study will enable us to evaluate appropriate PCA prescribing, pain control and significant adverse events within our institution.

Methods: This retrospective chart review will include patients during a 6-month period with medication orders for fentanyl, hydromorphone, or morphine PCAs and exclude patients managed on labor, delivery, and pediatric units. The primary endpoint is adequate pain control defined by the number of patient demands compared to delivery of boluses, change in reported pain scores, and use of breakthrough opioids. The secondary endpoints will assess appropriate prescribing measured through use of patient appropriate order sets, inclusion of a basal rate, indication, and use of standard PCA dosing regimens. Safety endpoints include incidence of adverse events, use of rescue agents, and respiratory depression risk.

Results: Assessment of adequate pain control will be recorded, and results will be presented. The number and percentage of orders that deviated from appropriate prescribing will be recorded and results will be presented.

Conclusions: It is anticipated that this project will help increase appropriate prescribing of patient-controlled analgesia and minimize risk of patient harm.
Conference Abstracts
May 16-18, 2022

Presenter Name: McAllister, Stephen
Organization: Temple University Hospital
Category: Pain Management/Palliative Care
Day | Session | Room | Time: Monday | 2 | Empire D | 3:45:00 PM

Authors: S. McAllister, E. Tencza, A. Schwell, B. Hart, D. Isenberg; Temple University Hospital, Philadelphia, Pennsylvania

Title: Analysis of the impact of analgosedation in the emergency department

Objectives: Mechanical ventilation is a major source of morbidity and mortality in the intensive care unit (ICU). Analgosedation uses analgesic agents for the maintenance of light sedation and is often referred to as analgesia-based sedation or analgesia-first sedation. The Richmond Agitation Sedation Scale (RASS) is a validated method for assessment of a patient's level of sedation in the ICU. Early deep sedation has been identified as an independent risk factor for delayed time to extubation, increased long-term mortality, and increased risk of hospital death. The objectives of this study were to evaluate analgosedation in the emergency department (ED) and its impact on short- and long-term ICU endpoints.

Methods: This retrospective, single-center, chart review identified patients via electronic medical record procedure notes for intubation between September 1, 2020 and September 1, 2021. Approximately 350 adult patients intubated in the ED at our institution were included in the study. Patients presenting to the ED for trauma, burn, status epilepticus, or requiring continuous paralysis after intubation were excluded as their treatment plans deviated from conventional analgosedation practices of light sedation. Continuous data will be analyzed using either the Student t-test or the Mann-Whitney U test. Categorical data will be assessed using either the Chi-Squared test or the Fisher's Exact test.

Results: The primary endpoint was the impact on 28-day ventilator free days after ED intubation. Secondary endpoints included self-extubation rates, 30-day mortality, and adherence to RASS goals for analgosedation. Secondary endpoints analyzed RASS scores at the time of transfer to the ICU and the time to appropriate analgosedation therapy. It is anticipated the results will reveal a correlation between light sedation (RASS 0 to -2) and shorter time to extubation and decreased mortality due to the use of non-analgesia-based treatment regimens such as monotherapy benzodiazepines, propofol, or dexmedetomidine. Final results will be presented after analysis is completed.

Conclusions: Findings of this study will help establish the importance of ED to ICU transitions of care and the potential impact of analgesia-based interventions on ICU patients boarding in the ED. The results from this research will be used to optimize analgosedation practices and better manage acutely ill patients at our institution.
Impact of a post-operative cardiothoracic surgery pain management order set on morphine equivalent daily dose

**Objectives:** The World Health Organization (WHO) proposed a stepwise analgesic ladder where patients with severe pain may escalate to opioid medications after being optimized on non-narcotic options. A multimodal pain management order set was implemented at St. Mary Medical Center for postoperative cardiothoracic (CT) surgery patients in May 2021. The objective of this study is to evaluate the efficacy and safety of the new pain management order set.

**Methods:** A single center, retrospective chart review of adult patients undergoing CT surgery between November 2020 and November 2021 was conducted at St. Mary Medical Center. The study timeframe consisted of six months pre-implementation and six months post-implementation of the pain management order set. Patients were excluded if they expired during their hospital stay, were intubated for more than 24 hours, were discharged within 24 hours of surgery, or did not receive the order set. The primary endpoint was the post-operative morphine equivalent daily dose (MEDD). Secondary outcomes included post-discharge MEDD, average pain score at 24, 48 and 72 hours post-operatively, length of hospital stay, length of cardiothoracic unit (CTU) stay, total pain consults, order set compliance, and the incidence of adverse events. The Mann-Whitney U test and Fisher's exact test were used to compare non-parametric data. Parametric data were compared using the t-test.

**Results:** A total of 166 patients met the inclusion and exclusion criteria with 86 patients in the pre-implementation group, and 80 patients in the post-implementation group. Baseline characteristics were similar between groups, with an average patient age of 68 years old, opioid naïve status in 98%, and the majority of patients being white males. There was no significant difference in post-operative MEDD during hospitalization (p-value = 0.90). The median post-operative MEDD in hospital was 18.96 mg (IQR: 10.43 – 32.35 mg) in the pre-implementation group, and 17.50 mg (IQR: 11.19 – 27.71 mg) in the post-implementation group. Most patients (97%) were opioid naïve and 88% were not discharged with opioids. Average maximum pain scores were not significantly different at 24, 48 and 72 hours post-operatively in both groups.
Length of hospital stay, length of CTU stay, pain consults, and adverse events were similar between groups.

**Conclusions:** No difference in post-operative MEDD was observed between the two groups. Pain scores were slightly reduced in the post-implementation group, but the difference was not statistically significant. Further studies with larger sample size are warranted to investigate the potential impact of this order set. The results indicate that there may be opportunities to optimize the current order set with the addition of other multimodal, non-opioid pain medications such as muscle relaxants and/or topical analgesics.
Presenter Name: Nyame, Adwoa
Organization: Johns Hopkins Bayview Medical Center and The Johns Hopkins Hospital, Baltimore, MD
Category: Pain Management/Palliative Care
Day | Session | Room | Time: Monday | 2 | Wild Rose A | 3:45:00 PM

Authors: A. Nyame, J. Waldfogel, L. Jablonski, O. Berger, S. Nesbit

Title: Evaluation of pain management in patients with cancer and substance use disorder

Objectives: Pain management in patients with cancer and substance use disorder is very complex and there is limited evidence to guide treatment. The purpose of this study is to characterize current pain and substance use management strategies in patients with a diagnosis of both cancer and substance use disorder.

Methods: This is a retrospective, cross-sectional, multi-site study within a single health system reviewing patients with ICD-10 diagnosis codes for cancer and substance use disorder and at least one ambulatory encounter within the Johns Hopkins Sidney Kimmel Comprehensive Cancer Center from January 1, 2019 to December 31, 2020. Specific objectives included identifying opioid risk mitigation strategies employed and characterizing the management of substance use disorders and pain in this patient population. Data were extracted from EPIC through a bulk query and analyzed using descriptive statistics.

Results: Results related to the characterization of pain management strategies, management of substance use disorders and risk mitigation strategies employed in this patient population will be recorded and results will be presented.

Conclusions: We anticipate that this project will demonstrate the complexities of pain management in patients with a diagnosis of cancer and substance use disorder.
Increasing knowledge of identification and treatment of opioid withdrawal through education to residents

**Presenter Name:** Patel, Nidhi  
**Organization:** Jefferson Abington Hospital  
**Category:** Pain Management/Palliative Care  
**Day | Session | Room | Time:** Tuesday | 4 | Magnolia D | 3:15:00 PM

**Authors:** Nidhi Patel, PharmD; Maria Foy, BS Pharm, PharmD, BCPS, CPE; Sharnae Stevens, PharmD

**Title:** Increasing knowledge of identification and treatment of opioid withdrawal through education to residents

**Objectives:** The primary outcome of this research is to ascertain improvement in provider comfort level and knowledge on identifying and managing opioid withdrawal after pharmacist driven education. The secondary outcome is assessing the most common challenges providers face.

**Methods:** This IRB approved study was conducted using prospective survey data collected from residents over a four month time frame. Internal medicine, family medicine, surgery, and obstetrics and gynecology (OBGYN) residents at JAH were emailed an anonymous survey that contained questions assessing the knowledge and comfort level associated with appropriately identifying and treating patients experiencing opioid withdrawal. Completed surveys were reviewed by a pharmacist and common challenges will be addressed through education. For the ongoing duration of this study, a pharmacist is providing training to the medical residents with a PowerPoint presentation during their corresponding weekly conference. Medical residents will be emailed the same anonymous survey after receiving education, and responses will be analyzed to compare data between the pre- and post-surveys.

**Results:** This research study is still in progress.

**Conclusions:** We hypothesize that the comfort level and knowledge of the medical residents will be increased after the pharmacist driven educational initiative.
Impact of CYP2D6 guided opioid therapy in chronic, non-cancer pain management as part of pharmacist-led medication safety reviews in the Program of All-inclusive Care for the Elderly (PACE) setting

Title: Impact of CYP2D6 guided opioid therapy in chronic, non-cancer pain management as part of pharmacist-led medication safety reviews in the Program of All-inclusive Care for the Elderly (PACE) setting

Objectives: Pharmacist-led pharmacogenomics (PGx)-guided opioid therapy can improve pain control and reduce the risk of opioid-related adverse drug events. The objective of this study is to evaluate the impact of drug-induced phenoconversion on the translation of PGx results in patients with chronic pain and polypharmacy. This study measures patient-reported pain and quality of life to assess the impact of PGx-led interventions on pain management.

Methods: This is a prospective study conducted in a Program of All-inclusive Care for the Elderly (PACE) setting. Enrolled patients had chronic, non-cancer pain and were prescribed CYP2D6-activated opioids (e.g., hydrocodone, oxycodone, tramadol). Clinical pharmacists translated PGx results; reviewed drug-drug interactions, drug-gene interactions, and drug-induced phenoconversion; and completed a comprehensive medication safety review using the clinical decision support system (CDSS) MedWise® to provide clinical recommendations to prescribing clinicians. Pain and quality of life were measured using a Numerical Rating Scale and the EuroQol-5D questionnaire (at visits 1-2-3 and visits 1-3, respectively).

Results: Data collection for this study is ongoing. To date, 31 patients have enrolled and 12 completed the study. Preliminary findings (n = 12) show that one patient is a CYP2D6 poor metabolizer (PM) based on genotype results. The current analysis demonstrated that eight patients (67%) underwent CYP2D6 phenoconversion (including 6 phenoconverted to PM) for their prescribed opioid due to drug interactions. Pharmacist recommendations were implemented for nine patients (75%); the average pain score (mean reduction of -1.83) was improved between visits 1 and 3. This average pain score worsened by an average increase of 2.34 points in patients without implemented recommendations (n = 3, 25%). Similar trends were observed in the changes in quality of life between the two groups.

Conclusions: Our preliminary results highlight the importance of drug-induced phenoconversion when translating PGx results in poly-medicated patients with chronic pain. Our findings support the expansion of PGx-guided chronic, non-cancer pain management, with drug-
induced phenoconversion evaluation using a CDSS to optimize chronic pain regimens and medication safety in older adult patients during the opioid epidemic.
Conference Abstracts  
May 16-18, 2022  

**Presenter Name:** Russo, Katharine  
**Organization:** Pennsylvania Hospital  
**Category:** Pain Management/Palliative Care  
**Day | Session | Room | Time:** Tuesday | 4 | Magnolia D | 2:45:00 PM  

**Authors:** K. Russo, P. Chhunchha; Pennsylvania Hospital, Philadelphia, PA  

**Title:** Patient controlled analgesia versus intravenous push opiates for pain management of vaso-occlusive crisis  

**Objectives:** Patient controlled analgesia (PCA) appears to be the preferred pain modality agent for treatment of pain associated with vaso-occlusive crisis. With limited data available in this patient population, this study analyzes the effectiveness of two different treatment modalities for pain management of vaso-occlusive crisis. The primary objective is to determine treatment effects among patients treated with PCA vs. intravenous push (IVP) opiates in the management of sickle cell disease pain crisis determined by a reduction in mean absolute difference in pain intensity (MPI) and total daily opioid requirement (MME) trends during inpatient hospitalization.  

**Methods:** This retrospective, single center, observational study evaluated differences in outcomes between patients treated with PCA vs. IVP during hospital admission between January 1, 2021 and June 30, 2021 for treatment of an acute pain crisis. Those who were >18 years old admitted to Pennsylvania Hospital with one of the following ICD codes; D57.0 (Hb-SS disease with crisis), D57.2 (Sickle cell/Hb-C disease) and D57.4 (Sickle Cell Thalassemia) were included. Patients were stratified in groups according to which treatment modality they were started on within the first 24-hours of admission.  

**Results:** The efficacy between PCA and IVP for treatment of vaso-occlusive crisis pain will be reviewed and results presented.  

**Conclusions:** It is anticipated that this research will add to the limited pool of data available for this patient population and will demonstrate which treatment modality is superior in controlling pain and improving hospital outcomes in sickle cell patients experiencing a vaso-occlusive crisis.
Opioid-induced sedation monitoring on general inpatient units at an acute care hospital

Objective: Opioid-induced unintended advancing sedation (OIUAS) is a precursor to opioid-induced respiratory depression (OIRD), a life-threatening decline in respiratory function following opioid administration. The objective of this study is to determine adherence to opioid-induced sedation monitoring per the hospital pain assessment policy by means of Richmond Agitation and Sedation Scale (RASS) or Pasero Opioid-induced Sedation Scale (POSS) documentation. The secondary objective is to determine the incidence of patients with out-of-range RASS/POSS scores and assess what, if any, interventions were documented.

Methods: Medical records of patients receiving at least one dose of as needed systemic opioid on general care units from August 2019 through August 2021 were reviewed. Patients in critical care settings, who were mechanically ventilated, or received opioids for intended advancing sedation were excluded. Adherence to sedation monitoring was assessed via documentation of RASS/POSS scores in the electronic health record (EHR) following opioid administration. A comparison was conducted to determine adherence to sedation monitoring documentation following the implementation of defaulted RASS/POSS entry rows in the nursing flowsheets. The following data was collected: patient age, sex, race, body mass index, predisposing comorbidities for OIRD, opioid naïve status, opioid administration date and time, route of administration, oral morphine equivalents (OME), RASS/POSS score, and intervention, if any, for RASS less than or equal to -1 or POSS greater than or equal to 3. Compliance to monitoring was set at 100% to highlight the importance of sedation monitoring following opioid administration.

Results: The percentage of both nursing assessments adherent to opioid-induced sedation monitoring, and patients with threshold RASS/POSS scores and corresponding interventions will be presented. The researchers hypothesize that RASS/POSS documentation will be greater in the period following the default implementation of sedation scores, and that interventions for out-of-range scores are not routinely documented.

Conclusions: The study investigators expect to present compelling data showing the importance of integration of sedation monitoring into clinical care for all patients receiving opioids for pain, with a focus on general care units, due to the risk for OIUAS and OIRD.
will encourage sedation score documentation, and education to providers on appropriate interventions following the documentation of out-of-range scores. Additionally, pharmacists will have the opportunity to provide data-driven recommendations when intervening on opioid orders based on previous opioid administration and sedation scores.
Conference Abstracts  
May 16-18, 2022

Presenter Name: Tranchita, Kara  
Organization: Shore Medical Center  
Category: Pain Management/Palliative Care  
Day | Session | Room | Time: Tuesday | 4 | Magnolia D | 3:00:00 PM

Authors: Kara Tranchita, PharmD, Shannon Burke, PharmD, BCPS

Title: Development and Implementation of Comprehensive Pain Management Protocols to Decrease Opioid Utilization

Objectives: The opioid epidemic dates back to the late 1990s. With increased prescribing of opioid medications, both prescription misuse and nonprescription misuse of opioids developed significantly throughout the U.S. This led The Department of Health and Human Services (HHS) to declare the opioid epidemic a public health emergency in 2017. Additionally, in 2019 over 70% of the nearly 71,000 drug overdoses in the US involved an opioid. This issue presents a distinctive opportunity to develop a comprehensive pain management assessment, treatment plan, and patient education program. Employing an opioid reduction program could decrease opioid usage or avoid opioid usage altogether.

Methods: This retrospective study was approved by the Pharmacy and Therapeutics committee. Patients admitted to the hospital and ordered opioids will be included. Patients are excluded if they are on hospice, receiving a continuous infusion of an opioid for pain/sedation, or have neonatal abstinence syndrome. The primary endpoint is percentage of patient encounters that receive opioids. Secondary endpoints include: number of patients discharged from the ED with an opioid prescription, number of patients receiving naloxone for opioid reversal, as needed opioids given without a pain scale, and as needed opioids given with an incorrect pain scale. The initial phase was development of pain management protocols to address all patient care types institution-wide. The second phase implemented these protocols and the outcomes were assessed. The opioid reduction program was guided by the principles: 1) an indication for pain management exists and 2) medications utilized are prescribed to the right patient, at the right time, at the lowest effective dose, for the shortest duration. With interdisciplinary participation from pharmacy, physicians, and nursing, opioid-sparing pain protocols were created.

Results: Over the time this study was conducted opioid usage overall has decreased. For the primary outcome, the percent of total encounters at SMC who received an opioid was 15.37% in quarter three and 14.65% in quarter four. Shore Medical Center’s total yearly average of opioid utilization has declined from 19.45% in 2020 to 16.51% in 2021. For the secondary outcomes, the percent of patients discharged from the emergency department with an opioid prescription was 7.17% in quarter 3 and 6.56% in quarter 4. Naloxone usage has remained stable.
throughout the hospital and over the past 6 months, on average naloxone has been used at a rate of 0.001, comparing naloxone administration to number of patients administered an opioid. Over the past 3 months the average percent of opioids given with no pain scale documented was 7% and the average percent of opioid doses given with an incorrect pain scale was 4.1%.

**Conclusions:** Providing education to physicians, nurses, and pharmacists on non-opioid alternatives for pain management, in conjunction with updating and including non-opioid analgesics to pain management protocols, resulted in decreased opioid utilization throughout the hospital. The percentage of patients who left the emergency room with an opioid prescription also decreased. Naloxone usage in the hospital has remained low, eluding to generally appropriate opioid dosage and use. Although, opioid administrations with no pain scale or an incorrect pain scale is relatively low on average, change in practice by requiring a pain scale be input through Cerner and additional education on appropriate pain scales can help to lower these occurrences in the future.
Review of perioperative management of buprenorphine in a community teaching hospital

**Presenter Name:** Trona, Anthony  
**Organization:** Conemaugh Memorial Medical Center  
**Category:** Pain Management/Palliative Care  
**Day | Session | Room | Time:** Wednesday | 6 | Magnolia B | 3:15:00 PM

**Authors:** A. Trona, N. Love; Conemaugh Memorial Medical Center, Johnstown, Pennsylvania

**Title:** Review of perioperative management of buprenorphine in a community teaching hospital

**Objectives:** The pharmacokinetics of buprenorphine cause interference with other opioids. This can be problematic for clinicians trying to manage the pain in patients receiving buprenorphine, specifically in the post-operative setting. Currently is no consensus as to whether buprenorphine should be continued or discontinued around the time of surgical procedures.

**Methods:** Patients documented as receiving buprenorphine for opioid use disorder (OUD) prior to inpatient surgery at Conemaugh Memorial Medical Center were reviewed to determine if buprenorphine was continued around the time of surgery. A retrospective evaluation was completed to evaluate opioid requirement in morphine milligram equivalents (MME), pain scores, and sedation scores. Data was compared for patients who continued buprenorphine versus those who held doses.

**Results:** The total MME and pain/sedation scores 48 hours post-operatively were evaluated, and results will be presented.

**Conclusions:** It is anticipated that this project will provide guidance for the continuation or discontinuation of buprenorphine prior to surgical procedures at Conemaugh Memorial Medical Center.
Evaluating a multimodal approach to pain management in enhanced recovery after cesarean section (ERAC) at a community hospital

**Authors:** M. Uchendu, M. Musheno, J. Shayka, N. Folger, F. Wellings, M. Roke -Thomas; Moses Taylor Hospital, Scranton, Pennsylvania

**Title:** Evaluating a multimodal approach to pain management in enhanced recovery after cesarean section (ERAC) at a community hospital

**Objectives:** Enhanced recovery after surgery using evidence-based care pathways has been shown to modify inflammatory and metabolic changes associated with surgery, and is associated with decreased hospital stay, improved patient satisfaction, and decreased opioid use. The purpose of this study is to evaluate the benefits of utilizing an enhanced recovery after cesarean section (ERAC) protocol in decreasing opioid use.

**Methods:** All patients 18 years and older who received a cesarean section at Moses Taylor Hospital from January to May (before ERAC implementation) and July to November (after ERAC implementation) of 2021 were evaluated for adherence to the Moses Taylor Hospital (MTH) ERAC protocol and for trends in opioid use and prescribing. Data were not analyzed during the transition period in June 2021 as education and training on the ERAC guidelines and protocol were conducted with all family birthing suite staff and pregnant patients. The effect of the protocol on inpatient opioid use will be evaluated by comparing the average morphine milligram equivalent (MME) per patient per admission before and after implementation using an independent samples t-test, and differences in the percent of patients who received scheduled acetaminophen and ibuprofen and the percent of patients discharged with opioid prescriptions despite not receiving opioids during admission will be analyzed using a Chi-square test.

**Results:** Interim analysis of post-operative pain medications (pre and post implementation) showed a decrease in average MME per patient per admission (38 to 30), an increase in percent of patients administered scheduled ibuprofen and acetaminophen (25 to 34) and a decrease in percent of patients discharged with opioid prescriptions who had not received an opioid while inpatient (17 to 13). Statistical analysis will be performed to determine the statistical significance of these findings and results will be presented.

**Conclusions:** We anticipate that the implementation of ERAC will significantly decrease patients' need of opioids for acute postoperative pain and increase the usage of scheduled non-opioids (acetaminophen and ibuprofen) for pain management.
Conference Abstracts
May 16-18, 2022

Presenter Name: Uchendu, Miriam
Organization: Moses Taylor Hospital Scranton, PA
Category: Pain Management/Palliative Care
Day | Session | Room | Time: Monday | 2 | Wild Rose A | 3:30:00 PM

Authors: M. Uchendu, M. Musheno, J. Shayka, N. Folger, F. Wellings, M. Roke -Thomas; Moses Taylor Hospital, Scranton, Pennsylvania

Title: Evaluating a multimodal approach to pain management in enhanced recovery after cesarean section (ERAC) at a community hospital

Objectives: Enhanced recovery after surgery using evidence-based care pathways has been shown to modify inflammatory and metabolic changes associated with surgery, and is associated with decreased hospital stay, improved patient satisfaction, and decreased opioid use. The purpose of this study is to evaluate the benefits of utilizing an enhanced recovery after cesarean section (ERAC) protocol in decreasing opioid use.

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Results: Interim analysis of post-operative pain medications (pre and post implementation) showed a decrease in average MME per patient per admission (38 to 30), an increase in percent of patients administered scheduled ibuprofen and acetaminophen (25 to 34) and a decrease in percent of patients discharged with opioid prescriptions who had not received an opioid while inpatient (17 to 13). Statistical analysis will be performed to determine the statistical significance of these findings and results will be presented.

Conclusions: We anticipate that the implementation of ERAC will significantly decrease patients' need of opioids for acute postoperative pain and increase the usage of scheduled non-opioids (acetaminophen and ibuprofen) for pain management.
Presenter Name: Uchendu, Miriam
Organization: Moses Taylor Hospital Scranton, PA
Category: Pain Management/Palliative Care
Day | Session | Room | Time: Monday | 2 | Wild Rose A | 3:30:00 PM

Authors: M. Uchendu, M. Musheno, J. Shayka, N. Folger, F. Wellings, M. Roke -Thomas; Moses Taylor Hospital, Scranton, Pennsylvania

Title: Evaluating a multimodal approach to pain management in enhanced recovery after cesarean section (ERAC) at a community hospital

Objectives: Enhanced recovery after surgery using evidence-based care pathways has been shown to modify inflammatory and metabolic changes associated with surgery, and is associated with decreased hospital stay, improved patient satisfaction, and decreased opioid use. The purpose of this study is to evaluate the benefits of utilizing an enhanced recovery after cesarean section (ERAC) protocol in decreasing opioid use.

Methods: All patients 18 years and older who received a cesarean section at Moses Taylor Hospital from January to May (before ERAC implementation) and July to November (after ERAC implementation) of 2021 were evaluated for adherence to the Moses Taylor Hospital (MTH) ERAC protocol and for trends in opioid use and prescribing. Data were not analyzed during the transition period in June 2021 as education and training on the ERAC guidelines and protocol were conducted with all family birthing suite staff and pregnant patients. An independent samples t-test will be used to evaluate the average morphine milligram equivalent (MME) per patient per admission before and after implementation and the Chi-square test to evaluate the differences in the percent of patients who received scheduled acetaminophen and ibuprofen and the percent of patients discharged with opioid prescriptions despite not receiving opioids during admission.

Results: Interim analysis of post-operative pain medications (pre and post implementation) showed a decrease in average MME per patient per admission (38 to 30), an increase in percent of patients administered scheduled ibuprofen and acetaminophen (25 to 34) and a decrease in percent of patients discharged with opioid prescriptions who had not received an opioid while inpatient (17 to 13). Statistical analysis will be performed to determine the statistical significance of these findings and results will be presented.

Conclusions: We anticipate that the implementation of ERAC will significantly decrease patients' need of opioids for acute postoperative pain and increase the usage of scheduled non-opioids (acetaminophen and ibuprofen) for pain management.
Presenter Name: Zheng, Cindy  
Organization: Nuvance Health - Norwalk Hospital, Norwalk, Connecticut  
Category: Pain Management/Palliative Care  
Day | Session | Room | Time: Tuesday | 4 | Magnolia D | 4:00:00 PM

Authors: Cindy Zheng, PharmD; Timothy Conboy, PharmD, MSHI, BCPS; Judy Huang, PhD, PharmD, BCPS, AAHIVP

Title: Gap analysis of best practice standards for opioid stewardship in standardize surgical order sets within a health system

Objectives: In the United States nearly 841,000 people have died from drug overdoses since 1999. In 2019, approximately 70% of drug overdose deaths involved the use of opioids. Furthermore, an estimated 51 million people undergo surgery annually with opioids being a key component to pain management. In health systems, computerized standardized order sets are used to promote standards of care. This is an area where incorporation of opioid stewardship practices can ensure safer use of opioids. This study investigates surgical standardized order sets (SOS) in one health system and aims to identify gaps in best practice standards for opioid stewardship.

Methods: A literature search was conducted to compile a list of best practice standards in opioid stewardship for pre- and post-operative surgical pain management. This list served as an assessment tool which was used to measure adherence to those standards for patient assessment, specialty consults, non-pharmacological/pharmacological choices, and discharge orders. A gap analysis in one health system’s surgical SOS was conducted against this assessment tool to determine the presence of these best practice standards. All surgical SOS within one health system's electronic health record (EHR), Cerner, was compiled for analysis. Specialty surgical SOS included cardiology, obstetrics, orthopedics, podiatry, urology, vascular, plastic, and general surgery. Data analysis involved the assessment of percent present for each best practice standard. A priority list for maximal interventions in improving opioid stewardship was generated.

Results: The assessment tool determined many best practice standards for opioid stewardship existed within at least one order set. Some pre-operative best practice standards that were not seen across all existing SOS. These included nonpharmacological therapies, specialty consults, multimodal preemptive therapy, no pre-operative opioids orders, education, and anxiolytics. All preoperative SOS included orders for pain screening and assessment opioid stewardship standards. All preoperative SOS lacked orders for opioid tolerance assessments, medication-assisted treatment for substance use disorders, and an opioid dose conversion tool. Some post-operative best practice standards that were not seen across all existing SOS. These included
side effect management, multimodal order options, no long-acting opioid orders, specialty consults, dose titration, anxiolytics, reversal agents, and discharge orders. All post-operative SOS included orders for pain reassessment, education, nonpharmacological therapies, pain levels, non-opioid therapies, short-acting opioid therapies, and intravenous and oral therapies. All post-operative SOS lacked orders for step-down approach to opioid management.

**Conclusions:** This study generated an assessment tool to identify gaps in best practices for opioid stewardship within a health system's SOS. It identified many best practice standards already exist within at least one SOS. By reviewing all surgical SOS, the analysis suggests a need to implement existing best practice standards across all surgical SOS in order to optimize opioid stewardship. The analysis also identified a need to build new computerized orders to implement best practice standards which lack presence. It is essential to optimize SOS for prescribers to further ensure safe and more effective opioid use. An assessment tool which identifies best practice gaps in surgical SOS is one effective way to optimize this.
**Presenter Name:** Abarintos, Hope Mae  
**Organization:** University of Rochester Medical Center, Golisano Children's Hospital  
**Category:** Pediatrics  
**Day | Session | Room | Time:** Monday | 2 | Empire B | 4:15:00 PM

**Authors:** HM. Abarintos, C. Kapuscinski, S. Stauber, T. Wheaton, M. Swartz, DJ. Hutchinson

**Title:** Impact of dexmedetomidine use on the incidence of hypertension following repair of coarctation of the aorta

**Objectives:** Children who undergo surgical repair of coarctation of the aorta (CoA) are at high risk of developing post-operative hypertension. Recent literature suggests a potential role for dexmedetomidine in reducing the incidence and severity of hypertension following repair. While there is limited data surrounding dexmedetomidine use in pediatric patients who have undergone cardiac surgery, the data that is published suggests several potential benefits, including decreased opioid requirements, incidence of junctional ectopic tachycardia (JET), and length of stay. The primary aim of this study was to assess the association of dexmedetomidine on the incidence of hypertension following repair of CoA in pediatric patients.

**Methods:** This was a single-center, retrospective cohort study among patients less than 19 years old who underwent surgical repair of CoA between January 1, 2016 and September 30. Subjects were divided into two groups: Dexmedetomidine initiation within the first 3 hours after surgery or no dexmedetomidine use within the first 24 hours after surgery. Patients were excluded if they were initiated on dexmedetomidine between 3 and 24 hours after surgery, required extracorporeal membrane oxygenation (ECMO), or died within first 24 hours following surgical repair. The primary outcome was incidence of hypertension within the first 4 to 24 hours after repair. Hypertension was defined according to the American Academy of Pediatrics definition of stage 2 hypertension.

**Results:** A total of 80 patients met inclusion criteria, among which 25 (31.25%) received dexmedetomidine within the first 3 hours after surgery. The median age at the time of procedure was identified to be 26 days (IQR 13-241) in the treatment group and 14 days (IQR 8-53) in the control group(p=0.014). The median maximum dose of dexmedetomidine received was 0.5 mcg/kg/hour (IQR 0.4-0.8) for a median duration of 17.5 hours (IQR 9.2-22.3). The primary outcome of hypertension was met in 7 (28%) patients in the treatment group and 12 (21.8%) patients in the control group, p=0.547. Those that received dexmedetomidine had shorter hospital length of stay, 7 days (IQR 4–10) vs 16 days (IQR 9–31), p=0.003. The treatment group was found to have higher incidence of requiring continuous antihypertensive therapy, 7 (28%) vs 4 (7.3%), p=0.03. There were no differences in need for intermittent antihypertensives,
cumulative opioid or benzodiazepine doses received, incidence of JET, or incidence of being discharged on antihypertensive therapy.

**Conclusions:** The use of dexmedetomidine was not associated with a reduction in incidence of hypertension following repair of CoA in pediatric patients. Our findings are limited by the retrospective study design and small sample size.
Objectives: Guideline recommended enoxaparin dosing in pediatric patients is 1.5mg/kg every 12 hours if <2 months old and 1mg/kg every 12 hours if >2 months old. More recent literature has suggested higher doses are required to obtain therapeutic anti-Xa levels in distinct age groups. Our institution utilizes dosing recommendations for venous thromboembolism (VTE) treatment found in that literature. The purpose of this study is to evaluate efficacy of institution specific therapeutic enoxaparin dosing in pediatric patients outside of the neonatal intensive care unit (NICU).

Methods: A retrospective chart review was conducted of enoxaparin dosing in pediatric patients outside of the NICU who received at least 1 dose of therapeutic enoxaparin for VTE with at least 1 appropriately drawn anti-Xa level between 8/1/2016 and 8/1/2021. Appropriately drawn levels were defined as anti-Xa levels for enoxaparin drawn 4 to 6 hours after at least the second dose. Patients were excluded if they were receiving enoxaparin prior to admission or for another indication. Data collected included: medication administration, laboratory data, and any signs of bleeding using with International Society of Thrombosis and Haemostasis (ISTH) criteria. Patients were divided into age groups: 1 to < 3 months, 3 to 12 months, 1 to 5 years, and 6 years and older. The primary efficacy endpoint was achievement of a therapeutic anti-Xa level with initial enoxaparin dosing. Therapeutic anti-Xa levels were defined as 0.6 – 1 units/mL. The primary safety endpoint was absence of major bleeding events. The secondary endpoint was compliance with institution specific therapeutic enoxaparin dosing. Appropriate descriptive statistics were used to analyze results.

Results: Forty-seven patients were included in the final analysis. The most common indication for enoxaparin was deep vein thrombosis (70%). A therapeutic anti-Xa level was achieved with initial dosing in 40.4% (n=19) of patients. Of those patients, 79% (n=15) were dosed per institutional recommendations. Overall, institutional recommendations were followed 59.6% of the time. There were no reported cases of bleeding associated with enoxaparin treatment.

Conclusions: Therapeutic anti-Xa levels are not routinely achieved with initial enoxaparin dosing in pediatric patients, with fewer than half of patients achieving therapeutic anti-Xa levels with initial dosing. Institutional recommendations are being followed about half the time but
resulted in greater obtainment of therapeutic levels. These results suggest that further research should be done to determine barriers to following institutional dosing recommendations.
Efficacy of a Hypoglycemia Protocol in Neonates for Reducing NICU Admissions

Objectives: Neonatal hypoglycemia is one of the leading causes for neonatal intensive care unit admissions and can lead to neurologic injury. Prophylactically treating newborns that are known to be at risk for developing hypoglycemia before they are hypoglycemic may decrease adverse reactions and preserve neurologic function. Treatment for hypoglycemia in newborns usually includes formula feedings and in more severe cases can require intravenous glucose. These treatments can lead to unfavorable outcomes by interrupting breastfeeding and mother-infant bonding. A less invasive and lower cost strategy to mitigate escalation to NICU admission can include prophylactic glucose gel administration for newborns at risk for developing hypoglycemia. The recommended prophylactic glucose dose for neonates is 200mg/kg/dose applied to the buccal cavity with a maximum of 6 doses in 24 hours. The purpose of this study is to add additional evidence to the limited literature that exists to support a more proactive approach to hypoglycemia management in neonates.

Methods: A list of newborns born at Inspira Medical Center beginning June 1, 2019 that have an order for prn glucose gel was ran and reviewed using inclusion and exclusion criteria to be the study group. A list of newborns born at Inspira Medical Center between March 2018 and April 2019 that have at least one glucose reading was ran to select a control group. Babies born before the hypoglycemia protocol was implemented (Beginning March 2018) are in the control group and babies born after the hypoglycemia protocol is implemented (Beginning June 1, 2019) are in the study group. The closed medical records will then be reviewed for race, gender, gestational age, hypoglycemia risk factor, NICU admission, hospital length of stay, glucose gel use, and blood glucose values. The difference in number of admissions to the NICU for hypoglycemia out of total number of babies with hypoglycemia will be evaluated.

Results: The primary endpoint of newborns that required an upgrade in care for hypoglycemia before the buccal glucose gel protocol was 9.17% and after the protocol was 4.17% (p 0.1205). Newborn upgrades in care for any cause was statistically significantly lower after the protocol; 21.67% vs 11.67% (p 0.0377). The secondary endpoint for length of stay before the protocol was 3.14 days and after the protocol was 2.61 days. The number of hypoglycemic events in total was 22 before and 25 after the protocol changes.
Conclusions: The implementation of the neonatal hypoglycemia protocol at this institution did not significantly decrease admissions to NICU or SCN for hypoglycemia in at-risk newborns. The implementation of the protocol did coincide with a significant decrease in admissions to NICU/SCN for any cause. The study showed that oral glucose may have the most impact in preventing hypoglycemia in babies born to a diabetic mother. Although the use of oral glucose gel did not show a significant decrease in NICU/SCN admissions, it is a less invasive strategy to increase serum glucose as compared to intravenous dextrose.
Development and implementation of a structured pharmacist-driven medication discharge program for pediatric patients

**Objectives:**
There is an increased risk of medication errors during transitions of care resulting in adverse drug events, visits to the emergency department, and hospital readmissions. Pediatric patients are particularly vulnerable due to weight-based dosing, various dosage formulations, and off-label use of medications. Recently published studies illustrate that a pharmacist-driven medication reconciliation program at discharge can decrease medication errors and reduce hospital readmission rates. There is currently no standardized medication discharge reconciliation process at Tufts Children's Hospital. The primary objective of this project is to develop and implement a structured pharmacist-driven discharge medication program that focuses on addressing medication errors and barriers for pediatric patients at Tufts Children's Hospital.

**Methods:**
Patients being discharged from the Tufts Children's Hospital general medicine service on at least one scheduled prescription medication were included in this study. In order to standardize the discharge process, a structured checklist identifying common areas of discrepancies was developed. On weekdays (excluding holidays) from December 1, 2021 through March 11, 2022, the pharmacist covering the pediatric general medicine service performed discharge medication reconciliation utilizing the checklist for qualifying patients. The checklists were then used to describe the quantity and types of medication discrepancies and barriers, as well as the cumulative pharmacist time dedicated to the discharge program.

**Results:**
There were 70 checklists completed during the study period. A total of 40 discrepancies were identified involving 22 of the 68 patients included in the study (32.3%). Barriers to medication access and errors in dosage formulation were the discrepancies most frequently identified and resolved, accounting for 32.5% and 30% respectively. The total amount of pharmacist time dedicated to this program was 17.6 minutes per shift.

**Conclusions:**
The implementation of a structured pharmacist-managed medication discharge program resulted in a reduction of medication errors. By rectifying these errors through pharmacist intervention, it is anticipated that this program had a positive impact on patient
outcomes such as time to discharge and rate of adverse drug events. A larger benefit may be seen with additional resources and full-time adoption of this service.
Anticoagulant stability of bivalirudin compared to unfractionated heparin in pediatric Berlin Heart recipients

Objectives: Bivalirudin is a direct thrombin inhibitor, which has been used in increasing frequency as an alternative to unfractionated heparin (UFH) as the primary anticoagulant in pediatric ventricular assist device (VAD) patients. Historically, UFH has been first line therapy in pediatric patients status-post implant with Berlin Heart VADs, however heparin resistance has been described as a consequence of low antithrombin 3 (AT3) concentrations specifically in the pediatric population. The consequence of less AT3 expression is a prolonged duration of time to achieve adequate therapeutic anticoagulation, and presumably less anticoagulation stability defined as a lower percent time in therapeutic range (%TTR). The objective of this study is to determine if bivalirudin provides superior %TTR monitored with activated partial thromboplastin time (aPTT) levels compared to unfractionated heparin in pediatric patients monitored with aPTT or anti-Xa implanted with a Berlin Heart VAD. Additionally, we would like to further characterize anticoagulant trends and clinical outcomes for the duration of device implantation.

Methods: A single-center, retrospective chart review was conducted at a large academic medical center that included patients aged <18 years, implanted with a Berlin Heart VAD, who were admitted between September 1st 2013 â€“ August 31st 2021. Patients were identified via the electronic medical record who received either UFH or bivalirudin as their primary anticoagulant. Patients were divided on the basis of anticoagulant received, including the period of UFH use (September 1st 2013 â€“ August 31st 2017) and period of bivalirudin use (September 1st 2017 â€“ August 31st 2021). Primary endpoints include time to reach therapeutic aPTT/anti-Xa and time within therapeutic aPTT/anti-Xa (%TTR). Secondary endpoints include incidence of INTERMACS defined bleeds, patient thrombosis, pump thrombosis, and survival to transplant or explant.

Results: A total of 31 patients were included within study analysis, 29 of which were implanted at our center and initiated on a continuous infusion anticoagulant. Of the patients included in the study, there were 20 (65%) patients who received bivalirudin and 11 (35%) patients who received heparin. Additional results will be presented.
**Conclusions:** It is anticipated that this project will demonstrate greater anticoagulant stability with bivalirudin compared to heparin in pediatric Berlin Heart recipients, which may translate into improved patient outcomes.
Evaluation of the non-pulmonary benefits after initiation of elexacaftor/tezacaftor/ivacaftor

Objective: The pulmonary benefits of elexacaftor/tezacaftor/ivacaftor (ETI) therapy in cystic fibrosis (CF) are well-documented across available literature while the non-pulmonary benefits are less well-known. The purpose of this research study was to evaluate endpoints that characterize the non-pulmonary benefits of ETI therapy in a pediatric population to better understand the full benefits and help elucidate factors that may contribute to choice of therapy.

Methods: A retrospective chart review of CF patients with active orders for ETI was completed between October 1, 2019 and December 31, 2021 for growth metric data (height, weight, body mass index (BMI) and associated z-scores) and pancreatic enzyme dosing at baseline (0), 3, 6, and 12 months. Patients ≥ 6 years of age with at least two data points (baseline and one follow-up) were included in the study. Charts were reviewed for hospitalization and antibiotic use two years prior to ETI approval and two years after approval in patients ≥ 12 years of age. The primary objectives were to determine whether there was an increase in BMI z-score after initiation of ETI at 3 and 6 months. Paired t-tests were used to assess change in baseline to 3-, 6-, and 12-month endpoints.

Results: A total of 33 patients were included in the study. The mean difference in BMI z-score between baseline and 3 months was 0.1 (95% CI: 0.0, 0.2; p = 0.0456) and 6 months was 0.09 (95% CI: -0.13, 0.31; p = 0.4167). The mean difference in pancreatic enzyme dosage between baseline and 3 months was -35.6 units/kg/meal (95% CI: -59.4, -11.8; p = 0.0048), 6 months was -42.16 (95% CI: -107.9, 23.6; p = 0.1944), and 12 months was -132.8 (95% CI: -358.4, 92.9; p = 0.2259). There were no clinically or statistically significant differences seen with the other growth metric endpoints. The median difference in number of antibiotic courses administered between baseline and the study period was -2.0 (IQR: -3.0-0.0; p = 0.0016). The median difference in the number of hospital admissions between baseline and study period was 0.0 (IQR: -1.0-0.0; p = 0.3750).

Conclusions: This study found that ETI therapy benefits CF patients by maintaining their BMI z-score. Pancreatic enzyme dose reduction at 12 months may indicate a clinically significant decrease over time. In addition, a significant difference was found in the number of antibiotic administrations compared to the baseline period. Although our sample size was likely too small...
to detect a true difference in hospital admissions, a reduction was seen compared to the baseline period. A larger sample size and longer follow-up period would be helpful to characterize the non-pulmonary benefits of ETI therapy.
A clonidine-based strategy to control shivering and agitation during cooling to treat neonatal hypoxic-ischemic encephalopathy and minimize opioid use.
Safety and efficacy of methylnaltrexone for opioid-induced constipation in pediatric patients

Objectives: Methylnaltrexone is a peripherally acting Âµ-opioid receptor antagonist FDA approved in adults for the treatment of laxative refractory opioid-induced constipation (OIC). The safety and efficacy of methylnaltrexone for OIC in children is not well established. The purpose of this study was to evaluate safety and efficacy in pediatric patients who received subcutaneous methylnaltrexone.

Methods: This was a retrospective cohort study of methylnaltrexone doses ordered between January 1, 2011 and September 1, 2021. Hospitalized patients less than 18 years of age receiving opioid therapy, who received at least one dose of subcutaneous methylnaltrexone were included. Patients with known or suspected gastrointestinal obstruction, who received another Âµ-opioid receptor antagonist or vinca alkaloid prior to methylnaltrexone administration were excluded. A treatment course was defined as consecutive doses of methylnaltrexone separated by no more than 72 hours. The primary endpoints were length of time to bowel movement after the first dose of methylnaltrexone and frequency of methylnaltrexone-related adverse events per treatment course.

Results: Twenty-two patients (median age: 10 years, range: 0.75-17 years) received a total of 27 treatment courses. At the time of methylnaltrexone administration, the median opioid dose was 2.7 mg/kg/day in oral morphine milligram equivalents (MME). Methylnaltrexone was ordered at a median dose of 0.152 mg/kg and most frequently administered as a one-time dose. The median time to bowel movement after the first dose of methylnaltrexone was 3.1 hours (interquartile range [IQR], 1.1-26.2 hours). Seventy-five percent of treatment courses (n=18) resulted in a bowel movement within 24 hours after the first methylnaltrexone dose. The most common adverse events were nausea and abdominal pain, which were present in 44% and 26% of treatment courses, respectively. No bowel perforations were identified.

Conclusions: This study is the largest to date to evaluate the safety and efficacy of methylnaltrexone in pediatric patients. The majority of treatment courses resulted in a bowel movement within 24 hours of therapy initiation. Methylnaltrexone was well tolerated with no serious adverse events identified. Larger, prospective studies are needed to confirm the safety
of methylnaltrexone in a pediatric population and to assess the cumulative effect of subsequent doses in patients who do not respond to a single methylnaltrexone dose.
Conference Abstracts  
May 16-18, 2022

**Presenter Name:** Geraci, Emily  
**Organization:** Penn State Health Milton S. Hershey Medical Center  
**Category:** Pediatrics  
**Day | Session | Room | Time:** Wednesday | 6 | Magnolia C  |  4:30:00 PM

**Authors:** Emily Geraci, Carrie Cake, Kevin Mulieri, Norman E. Fenn III  

**Title:** Evaluation of antiemetics in the management of pediatric cannabinoid hyperemesis syndrome

**Objectives:** As a result of recent legislative changes allowing for increased access to recreational and medicinal marijuana products, there have been increasing rates of cannabis abuse among adolescents and subsequent diagnoses of cannabinoid hyperemesis syndrome (CHS). The majority of available literature on this syndrome exists within the adult population and describes benzodiazepines, butyrophenones, and topical capsaicin as potentially efficacious in the management of CHS. The objective of this study is to evaluate the efficacy and safety of antiemetic medications in the management of pediatric CHS.

**Methods:** A review of electronic medical records was performed to identify patients aged ≤18 years who had an emergency department or inpatient encounter at the Penn State Children’s Hospital and had a cannabis hyperemesis-related diagnosis code. Patients were included if they had a clinical diagnosis of CHS with a minimum frequency of weekly use of marijuana plus any of the following symptoms: (1) stereotypical episodic vomiting resembling cyclic vomiting syndrome in terms of onset, duration, and frequency; (2) resolution of symptoms with cessation of tetrahydrocannabinol products; (3) relief with external thermoregulation; (4) epigastric or periumbilical pain. Descriptive statistics were utilized for demographic data, and Kruskal-Wallis tests were performed to compare appropriateness of antiemetic therapy to post-antiemetic nausea and vomiting and length of stay outcomes, as well as individual antiemetics to post-antiemetic nausea and vomiting outcomes.

**Results:** There was no difference between appropriateness of antiemetic and post-antiemetic nausea and vomiting outcomes or appropriateness of antiemetic and length of stay. Results comparing individual antiemetics to post-antiemetic nausea and vomiting outcomes are forthcoming.

**Conclusions:** In this retrospective study, utilization of appropriate antiemetics did not demonstrate a significant difference in post-antiemetic nausea and vomiting or length of stay outcomes. While benzodiazepines, butyrophenones, and topical capsaicin have demonstrated some benefit in CHS in the adult population, further prospective studies in the pediatric population are required to fill existing gaps in knowledge and to elucidate an optimal treatment algorithm for this condition.
Authors: Jared M. Gilbert, PharmD, Henry Poon, PharmD, Troy Kish, PharmD, BCPS

Title: Impact of major depressive disorder on medication adherence in veterans with HIV infection

Objectives: Major depressive disorder (MDD) is the most common neuropsychiatric complication in HIV-infected patients and may present in all phases of the infection. Patients living with MDD often experience pessimism, cognitive impairment, and withdrawal from social support, which can diminish both the willingness and ability to follow treatment directions. Other studies have evaluated effects of MDD on other disease states, but few have examined effects of MDD on HIV related outcomes. The purpose of this medication use evaluation (MUE) is to evaluate the effect of major depressive disorder (MDD) on HIV outcomes in HIV infected patients as measured by medication possession ratios (MPR) of antiretroviral therapy (ART), number of times viral load was inadequately suppressed causing viral loads of ≥200 copies/mL, number of times CD4+ count was ≤200 c/mL, and new occurrence of AIDS defining illnesses such as Pneumocystis pneumonia (PCP).

Methods: A retrospective chart review was conducted to assess HIV related outcomes among veterans who were diagnosed with HIV compared to those with concomitant HIV and MDD from the period of January 2016 to January 2017. Patients were included if they were > 18 years of age with a diagnosis of HIV (Cohort 1) or with a diagnosis of HIV and MDD (Cohort 2). Patients were excluded if they had a neuropsychiatric diagnosis other than MDD, had an HIV or MDD diagnosis after the start of the MUE period, received HIV or MDD care outside of the VA network, had an untreated HIV diagnosis, or if they were in Cohort 1 and already on an antidepressant. Data was collected with respect to age, race, ethnicity, sex, date of HIV diagnosis, duration of time since HIV diagnosis, ART regimen and dosing frequency, antidepressant regimen, number of times VL was ≥200 c/mL and CD4+ count was ≤200 c/mL, CD4+ nadir, MPR of ART and antidepressant therapy, number of times seen by mental health or primary care providers, and new occurrences of AIDS defining illnesses such as PCP. Sample size was insufficient to achieve statistical significance in analysis and therefore results were analyzed with descriptive statistics.

Results: A total of 190 patients were identified who were > 18 years of age and were diagnosed HIV (cohort 1) or were diagnosed with HIV and MDD (Cohort 2). A total of 62 patients were excluded based on the exclusion criteria, resulting in a Cohort 1 of 75 patients and a Cohort 2 of
53 patients. Median age of Cohort 1 and Cohort 2 was 65 (33 â€“ 91) and 67 (33 â€“ 86) years, respectively. Both Cohort 1 and Cohort 2 were predominately Black or African American race at 69% (n = 52) and 64% (n=34), respectively. Both cohorts had similar rates of males (96%), similar rates of Hispanic or Latino ethnicity (26%), and similar duration of time since HIV diagnosis (13 years). Patients in Cohort 1 compared to Cohort 2 had a higher median MPR of ART (92% [24.7 â€“ 100] versus 89% [16.4 â€“ 100]), a lower percent of occurrences where viral load increased ≥200 copies/mL (15% versus 17%), a lower percent of occurrences where CD4+ count decreased ≤200 (9% versus 15%) and had a lower percent of new onset AIDS defining illnesses (1% versus 6%).

Conclusions: There was a difference in MPR and rates of new onset AIDS defining illnesses suggesting worse HIV outcomes in HIV-positive patients with concomitant MDD compared to those without MDD. The results of this MUE imply that depression screening and treatment need to be included during routine visits in the management of patients with HIV.
**Conference Abstracts**
May 16-18, 2022

**Presenter Name:** Haran, Tigris  
**Organization:** Albany Med Health System  
**Category:** Pediatrics  
**Day | Session | Room | Time:** Wednesday | 6 | Magnolia C | 3:30:00 PM

**Authors:** Tigris Haran PharmD, Samuel Hymes MD, Amy Mitchell VanSteele PharmD BCPPS

**Title:** Evaluation of vancomycin use in pediatric patients with respiratory illnesses

**Objectives:** Antibiotics with methicillin resistant staphylococcus aureus (MRSA) coverage should be reserved for severe systemic illnesses with high risk of mortality from suspected or confirmed MRSA infections. The likelihood of a MRSA respiratory infection increases for recently hospitalized patients, chronically ventilated patients, line placements, or recent parenteral antibiotics. Vancomycin minimum inhibitory concentrations (MIC) are trending upward due to overuse, inappropriate dosing, and prolonged duration. The purpose of this study is to evaluate appropriate vancomycin use in pediatric patients with respiratory illnesses.

**Methods:** This retrospective chart review evaluated pediatric patients who received at least one dose of vancomycin empirically on admission for a respiratory illness between January 2018 and August 2021. Patients were excluded if they were less than 4 months, older than 18 years of age, or if they had a diagnosis of cystic fibrosis or neutropenic fever. An internal algorithm was used to assess patient's risk for MRSA infection. Vancomycin use was inappropriate if no MRSA risk factors were identified, failure to de-escalate treatment, and empiric coverage greater than 48 hours with negative culture. Data collection included demographics, MRSA risk factors, cultures and sensitivities, vancomycin dosing regimen, drug levels, and other antibiotic use. This data was stored and integrated into Redcap. Statistical analysis performed was descriptive.

**Results:** Fifty-eight out of 552 patients met the inclusion criteria. Forty-three percent (25/58) of patients did not have MRSA risk factors, 3.4% (2/58) had failure to de-escalate antibiotics, and 25% (15/58) continued with vancomycin greater than 48 hours despite negative cultures. Out of the 58 patients reviewed, one patient had confirmed MRSA and one patient had streptococcus species with resistance to beta lactams, both of these patients did not have MRSA risk factors. Overall 32% (19/58) met criteria for appropriate vancomycin use.

**Conclusions:** The assessment pathway algorithm designed for this study was useful for identifying MRSA risk factors for infections. Future research should focus on adapting this algorithm as a decision making tool for initiating vancomycin. This study has identified areas of future antibiotic stewardship intervention that can improve our appropriateness of vancomycin use.
**Conference Abstracts**  
May 16-18, 2022

**Presenter Name:** Hartley, Christopher  
**Organization:** Maine Medical Center  
**Category:** Pediatrics  
**Day | Session | Room | Time:** Wednesday | 6 | Magnolia C | 3:45:00 PM

**Authors:** Christopher Hartley, PharmD; Jonathan Bourque, PharmD, BCPPS, BCPS; William Crall, PharmD, BCPPS; Michael Ferguson, MD; Jessica Miller, PharmD, BCPPS, BCPS

**Title:** Evaluation of a standardized two-bag protocol for the management of diabetic ketoacidosis in pediatric intensive care unit patients

**Objectives:** The purpose of this study was to compare a one- vs. two-bag system for treatment of diabetic ketoacidosis (DKA) in respect to electrolyte abnormalities, time to resolution of DKA, decreased length of stay, and decreased cost to the patient. The two-bag system utilizes a balanced fluid as a base, Normosol®, with similar electrolyte composition in each bag, but one with and the other without dextrose.

**Methods:** This retrospective review evaluated pediatric patients admitted to the Pediatric Intensive Care Unit (PICU) at Maine Medical Center between January 1, 2014 and June 31, 2021 for treatment of DKA. Patients were included if they were less than 18 years old, admitted to the PICU, received a continuous intravenous insulin infusion, and had a diagnosis of DKA. Patients were excluded if they had adrenal insufficiency, or if they received systemic corticosteroids within 48 hours of DKA treatment. DKA severity was classified as mild (pH less than 7.3 or bicarbonate less than 15 mEq/L), moderate (pH less than 7.3 or bicarbonate less than 10 mEq/L), or severe (a pH less than 7.1 or bicarbonate less than 5 mEq/L.) Amount of electrolyte repletion in addition to the standard electrolyte replacement bags were assessed. Incidence of electrolyte disturbances (potassium, chloride, phosphorus, and magnesium) and associated treatments were collected. Time to resolution of DKA was also assessed. Resolution was defined as 2 sequential lab values of bicarbonate greater than 15 mEq/L, pH greater than 7.3, anion gap less than 12 mEq/dL, and glucose less than 200 mg/dL.

**Results:** Results will be presented at Eastern States Conference.

**Conclusions:** It is anticipated that less electrolyte repletion will be required in patients who received the two-bag method, as well as more overall potassium and phosphorus provided to patients in the two-bag method group. Additionally, it is anticipated that the cost of the two-bag method to not be more expensive than the one-bag method.
Authors: H. Honor, J. Low; Dartmouth-Hitchcock Medical Center (DHMC), Lebanon, New Hampshire

Title: Implementation of pediatric standard concentrations at a critical access hospital

Objectives: Medication safety is an important priority for all hospitals, both academic medical centers and critical access hospitals. Incorporating safe medication use principals, especially in emergency preparedness, is paramount to patient care. In critical care access hospitals, patient populations can vary from academic medical centers, however they must be prepared to provide 24/7 emergency care services to all patients, including pediatrics. Optimizing IV admixture programs at critical access hospitals can improve patient care and facilitate transport to referral centers for higher levels of care. Goal of this project is to implement standard concentrations for pediatric IV medications at a critical access hospital without 24-hour pharmacy services to increase medication safety.

Methods: A list of medications was compiled through an Epic report of the IV medications used within the last year (September 30th, 2020 - September 30th, 2021), medications stocked within the code cart or Emergency Room automated dispensing cabinet, and any medications identified by the critical access hospital staff. An evaluation of the medication ordering process was performed, along with a review of available products that are stocked at the critical access hospital. The finalized list of changes, reviewed by the hospital staff, will be implemented in the electronic health record, preparation procedures will be shared with nursing as the primary preparers of medications, and the infusion pump drug libraries will be updated as needed.

Results: Between September 30th, 2020 - September 30th, 2021, the following were administered in the emergency room; 4 antibiotic doses, 14 controlled substance doses, and 34 non-controlled doses. Of the 35 unique medications that were identified, 19 were on ISMP's High Alert List. There were 9 medications with multiple standard concentrations, of which 7 were on ISMP's High Alert List. The list also included 8 antimicrobials and 10 code cart medications for standardization.

Conclusions: Implementation of standardized IV products and concentrations at a critical access hospital within a large healthcare network is an intricate process. While many IV products were infrequently used, having a standardized process can help prevent future medication errors.
Authors: Morgan Jones, PharmD, Micah Butcher, PharmD, BCPPS, Jenni Shahan, PharmD, BCPPS, Lesley Cottrell, PhD

Title: NICU order set utilization rate by providers after implementing and educating on computerized provider order entry (CPOE) optimization strategies

Objectives: At WVU Medicine Children's Hospital, multiple pediatric order sets are established with a goal to decrease medication error rates, reduce practice variation, and encourage adherence to organizational standards of care. In the neonatal intensive care unit (NICU) at WVU Medicine Children's Hospital, the provider utilization rate of the neonatal pain and sedation order set is low. The purpose of this project is to identify CPOE order set optimization strategies to increase utilization rates of the NICU pain and sedation order set, which could potentially expand to other pediatric order sets if successful.

Methods: Optimization strategies included adding synonyms to the EHR for the order set based on each medication available within and identifying providers to add the order set as a favorite for, to increase provider visibility. Baseline data was collected by obtaining the ERX numbers of all intermittent, continuous, and combination drip/bolus medication orders in the order set, order set the medication came from, location, date, and provider who ordered it. The same process occurred for collecting 4-month post implementation data and will occur for 6-month final post data. Utilization rates of the order set were calculated by dividing the total number of medication orders that came from the neonatal pain and sedation order set by the total number of medications ordered with those ERX numbers in that time period. Prior to the implementation period in November 2021, the providers were educated on the order set and optimization strategies, and a survey was sent to them in early March 2022 seeking their opinion on NICU order sets.

Results: The baseline usage of this order set was 13% which is around the same utilization rates of most other order sets in the NICU. A sample size of 56 orders was calculated for a power of 80% to see an increase in the utilization to 35% post intervention. The utilization rates of this order set at the 4-month post assessment were 30.6% which is an increase of 17.6% from the baseline utilization rate of 13%. The survey sent to providers in March yielded results validating that they are less likely to use the order set if it is not easily visible in order entry. The 6-month assessment will be analyzed in May.
Conclusions: The provider feedback further affirms the results as they are more likely to use the order set if it is visible and easy to find. While the 6-month post period of the study has not been finalized, based on this data, we can conclude that the interventions and education increase utilization rates of order sets in the NICU at WVU Medicine Children's. These interventions may be able to be extrapolated for other order sets at WVU Medicine Children's and amongst other institutions.
Outcomes associated with broad-spectrum antibiotic use in a level III neonatal intensive care unit

Authors: So Young (Regina) Jung, PharmD and Susannah Franco, PharmD, BCPS

Title: Outcomes associated with broad-spectrum antibiotic use in a level III neonatal intensive care unit

Objectives: Previous retrospective studies have reported an increased risk of invasive fungal infections and death with the use of carbapenems and third-generation cephalosporins in the neonatal population, while prolonged antibiotic use is linked to necrotizing enterocolitis, late-onset sepsis, and death. Furthermore, cefepime is associated with the emergence of resistant gram-negative isolates, which is a growing concern with the rise of bacterial resistance. These adverse outcomes highlight the need for improvements in antibiotic stewardship. This single-center, retrospective, observational study aims to evaluate the outcomes associated with the use of meropenem, piperacillin-tazobactam, and third- and fourth-generation cephalosporins in the neonatal intensive care unit (NICU) compared to narrow-spectrum agents defined as standard therapy.

Methods: The study includes patients admitted to the NICU between January 2019 and December 2021 whose first antibiotic treatment after birth was a course of either standard therapy or broad-spectrum antibiotics at least 48 hours in duration. Any courses of antibiotics less than 48 hours in duration or courses initiated without obtaining cultures were not included. The primary outcome is the composite of the number of patients growing resistant bacteria, incidence of necrotizing enterocolitis, incidence of candida colonization, and 28-day mortality. The secondary outcomes are the individual components of the primary outcome, number of prolonged antibiotic courses longer than 72-hours in duration, and total duration of all antibiotic courses.

Results: Outcomes and statistical analyses will be presented.

Conclusions: The investigators hope to utilize the results of this study to improve patient outcomes and assist with initiating antibiotic stewardship efforts in our institution's neonatal population.
**Presenter Name:** Ngo, Tracey  
**Organization:** Nazareth Hospital  
**Category:** Pediatrics  
**Day | Session | Room | Time:** Wednesday | 6 | Magnolia C | 3:15:00 PM

**Authors:** Ngo T., Makem N., Warrick E., Nazareth Hospital, Philadelphia, Pennsylvania

**Title:** Evaluation of pediatric medication dosing in the emergency department: a retrospective analysis

**Objectives:** The emergency department is a high-risk environment for medication errors due to a hectic environment with frequent interruptions, use of technology lacking pediatric safety features, and a fast paced work flow. Medication errors are the most common error in hospitalized patients and occur up to 3 times more often in children as compared to adults. The most common medications involved in errors include acetaminophen, ibuprofen, antibiotics, analgesics, and corticosteroids. The purpose of this retrospective study was to evaluate the effectiveness of the pediatric dosing sets post provider education that were made for commonly used medications for pediatric patients in the emergency department at Nazareth Hospital.

**Methods:** This is a single-center, retrospective chart review conducted on emergency department medication orders for children ages 16 or younger between February 22, 2022 to April 30, 2022. Inclusion criteria consisted of patients between the ages of 0 and 16 years old who were treated in the emergency department and received at least one dose of a medication. Patients were excluded if they did not have a documented weight in their medical record. All medication orders were entered via Meditech. Those ordered through the patient triage list are auto-verified whereas orders placed through the patient profile are sent to the pharmacy queue to verify. A dose error was defined as a dose greater than or equal to 15% above or below recommended dose range based on age or weight. Dose ranges were considered within recommended range if found in Lexicomp Pediatric and Neonatal Lexi-Drugs. Data will be evaluated through descriptive analysis. No statistical tests will be performed.

**Results:** The number and percentages of medications involved in dosing errors and medication classes involved in dosing errors will be recorded and results will be presented.

**Conclusions:** It is anticipated that this project will demonstrate that the pediatric dosing sets have been effectively utilized and have helped to decrease the prescribing error rate in the emergency department.
Utilization of Asparaginase Activity Monitoring in Pediatric Acute Lymphocytic Leukemia and Lymphoma Patients

Patt, Elizabeth

Presenter Name: Patt, Elizabeth  
Organization: Penn State Health Milton S. Hershey Medical Center  
Category: Pediatrics  
Day | Session | Room | Time: Wednesday | 6 | Magnolia C | 4:15:00 PM

Authors: Elizabeth M. Patt, PharmD; Kevin M. Mulieri, PharmD, BCPPS; Daniel J. McKeone, MD

Title: Utilization of Asparaginase Activity Monitoring in Pediatric Acute Lymphocytic Leukemia and Lymphoma Patients

Objectives: Asparaginase is a key therapeutic agent in the treatment of pediatric and adolescent acute lymphoblastic leukemia (ALL) and lymphoma (ALLy). Asparaginases enzymatically deplete L-asparagine in the blood, depriving leukemic cells of this amino acid that they are unable to produce. Therapeutic efficacy can be evaluated by measuring blood asparaginase activity levels. Activity levels may be negatively impacted by rapid clearance of the drug or by the phenomenon of silent inactivation. Patients who are silent inactivators may have no identifiable hypersensitivity reaction, but derive no therapeutic benefit from the drug. In these patients, a change in formulation from pegaspargase to erwinia-derived asparaginase is indicated. At our institution, a protocol exists for monitoring asparaginase activity levels following administration of any asparaginase product. This project aimed to evaluate compliance to the established monitoring protocol, and characterize the frequency with which the therapeutic agent was substituted appropriately. Additionally, frequency of adverse events attributable to asparaginase were assessed in conjunction with subsequent required medical interventions.

Methods: Courses of pegaspargase or erwinia asparaginase administered between July 1, 2016 and June 30, 2021 were evaluated. Patients were included who were under the age of 25 years, had a documented diagnosis of ALL, and were treated by the pediatric hematology and oncology service. Data was collected via review of the electronic medical record.

Results: 115 patients were assessed, receiving a total of 507 doses of pegaspargase or courses of erwinia asparaginase. The majority of patients (n = 89) were diagnosed with B-cell ALL; the median age was 7 years (IQR 3.5, 13). Overall protocol compliance was low, with asparaginase activity levels being drawn in 31% of the instances in which they were indicated. Levels were drawn within an appropriate time frame per protocol 62.3% of the time. 33 patients (28.6%) were switched from pegaspargase to erwinia asparaginase.

Conclusions: At our institution, significant opportunities to improve asparaginase monitoring exist.
Objectives: Phase 1 of this study retrospectively evaluated current institutional practices of ordering, compounding, and administering large volume, diluted high-dose methotrexate (HDMTX) for pediatric patients diagnosed with high-risk acute lymphoblastic leukemia (ALL). Based on the results observed in phase 1, phase 2 will consist of development of a new compounding procedure and educational presentation on administering undiluted HDMTX with hopes to mitigate prolonged infusion times and the potential for delayed methotrexate clearance. A retrospective review post-implementation of the new undiluted HDMTX process will then be conducted to assess for efficacy of completed infusions within 24 hours.

Methods: A single-center, institutional review board approved study was conducted in two phases: phase 1 consisted of a retrospective review of patients who received diluted HDMTX between March 2017 to September 2021, and phase 2 will consist of implementation of a new process utilizing an undiluted HDMTX method. Similarly to phase 1, phase 2 will retrospectively collect patient information on total infusion time, changes in infusion rates, methotrexate levels, and leucovorin rescue doses after new compounding procedures, undiluted HDMTX order templates, and extensive nursing education are implemented.

Results: Phase 1 of this study included 42 encounters, and it was found that with large volume, diluted HDMTX, 17 encounters (40%) resulted in prolonged infusion times greater than 24 hours, 12 encounters (29%) resulted in delayed methotrexate clearance, and 3 encounters (6%) resulted in acute kidney injury. Infusion rates were manipulated at least once in 48% of encounters, and 2% of encounters had up to seven rate changes in attempts to complete the infusion on time. The new undiluted HDMTX compounding and administration process that will be used in phase 2 of this study will be presented.

Conclusions: Phase 1 results corroborated what has been found in other studies, where patients older in age with higher weight and BSA who require multiple large volume bags exhibit delayed methotrexate clearance. Extended infusion times beyond 24 hours and delayed methotrexate clearance were found to be associated with acute kidney injury. It is anticipated that a new compounding and administration procedure utilizing undiluted HDMTX in conjunction
with alkalizing fluids administered via y-site will help to mitigate prolonged infusion times and the potential for delayed clearance.
Author Name: P. Rajendran, K. Yakobosky; Reading Hospital Tower Health, West Reading, Pennsylvania

Title: Evaluation of the impact of various treatment regimens on hospital length of stay in neonatal abstinence syndrome babies after in-utero exposure to opioids

Objectives: The primary outcome of this study is to determine the optimal pharmacologic regimen in reducing hospital length of stay (LOS) in neonates treated for neonatal abstinence syndrome (NAS). Our secondary outcome is to evaluate the correlation between the amount of morphine used to treat NAS and LOS. An additional secondary outcome is to evaluate if there is a difference in LOS after in-utero exposure to buprenorphine or methadone.

Methods: Three different NAS treatment regimens were used by our neonatal intensive care unit (NICU) for NAS patients over the past several years (July 2015 – January 2020). The following three regimens list first, second- and third-line agents for the respective time periods: morphine/phenobarbital/clonidine (7/19/15- 10/31/16), morphine/clonidine/phenobarbital (11/1/16- 11/30/17), clonidine/morphine/phenobarbital (12/1/17- 1/26/20). Retrospective chart reviews of neonates diagnosed with NAS and their mothers admitted from July 2015 to January 2020 were reviewed to assess neonatal hospital LOS.

Results: The clonidine/morphine/phenobarbital or clonidine-focused regimen had the lowest median LOS of 17 days (p < 0.027). Increased utilization of morphine used to treat NAS correlated with higher median LOS with 0-50 mg/stay resulting in the shortest median LOS of 18 days and 151-200 mg/stay resulting in the longest median LOS of 52.5 days. Lastly, maternal buprenorphine use was associated with a shorter median LOS of 16 days versus methadone of 30 days.

Conclusions: Results from the primary and secondary outcomes confirm the change in Reading Hospital's NICU practice of utilizing clonidine-focused therapy as first line treatment for NAS neonates.
Mycophenolate dosing strategy and therapeutic drug monitoring relationship to outcomes in pediatric solid organ transplant patients

Objectives: Maintenance immunosuppressive regimens are required post-solid organ transplant (SOT) to prevent allograft rejection. In pediatric SOT recipients, mycophenolate dosing varies among organs with limited evidence that correlates dosing strategies to efficacy, adverse outcomes, and drug levels. This study aims to retrospectively review mycophenolate dosing strategy, corresponding mycophenolic acid and metabolite levels, along with adverse clinical outcomes.

Methods: A retrospective chart review was conducted of patients aged 0-21 years old, who underwent SOT (heart, kidney, or liver) from March 1, 2016 to February 28, 2021. Multivisceral and isolated small bowel transplant recipients were excluded from analysis. Patients were categorized into two study cohorts: 500-700 mg/m²/dose and 12.5-17.5 mg/kg/dose. Primary endpoints include the relationship between dosing strategy and adverse effects as a composite of diarrhea, thrombocytopenia, leukopenia, and infection. Secondary endpoints include the relationship between mycophenolate drug concentrations and incidence of adverse effects as the composite outcome noted above. Additional secondary outcomes include the relationship of dosing strategy and mycophenolate drug concentrations on biopsy proven rejection, dose reductions, drug discontinuation, graft loss, and death.

Results: The number and percentage of the described outcomes above will be presented.

Conclusions: This project will determine the relationship between mycophenolate dosing strategy and drug levels to adverse outcomes in order to optimize management in pediatric SOT patients.
Conference Abstracts
May 16-18, 2022

Presenter Name: Sherman, Nicholas
Organization: Nemours Children's Hospital
Category: Pediatrics
Day | Session | Room | Time: Tuesday | 4 | Wild Rose A | 2:45:00 PM

Authors: N. Sherman, S. Chan, C. Shapiro, S. Sathish, M. Attia; Nemours Children's Hospital, Wilmington, Delaware

Title: Evaluation of Empiric Management of Urinary Tract Infections (UTI) and Urine Culture Review Practice in a Pediatric Emergency Department (ED)

Objectives: According to the CDC, in 2019 alone, 251.1 million antibiotic (ABX) prescriptions were dispensed from US pharmacies. Urinary tract infection (UTI) is one of the common reasons for ABX prescriptions in the ambulatory practice setting and approximately 77% of these prescriptions are inappropriate. The emergency department (ED) should be a forefront for antimicrobial stewardship efforts given the high frequency of infection diagnosis and ABX prescriptions. UTI is among the most common indications for discharged ABX prescriptions in the ED. Empiric ABX therapy is often not discontinued or narrowed when the urine culture is negative, or ABX susceptibility is resulted. The objective of our study is to evaluate the current ED management of UTI and to assess the need for a urine culture follow-up program.

Methods: This is a retrospective descriptive evaluation of patients diagnosed with UTI in the ED between Jan â€“ June 2021 at Nemours Children's Hospital Delaware (NCH-D). Objectives include evaluation of UTI management, urine culture follow-up, and identification of opportunity for a pharmacist-led culture review program. Patients greater than or equal to 2 months who were discharged from the ED with an UTI diagnosis and were prescribed an ABX are included. Patients with complex medical history including underlying urologic conditions are excluded. Electronic medical records will be reviewed, and data collection includes patient demographic, clinical, and laboratory information. A positive urinalysis (UA) is defined as moderate or large leukocyte esterase, positive nitrites, or WBC > 5/HPF. A positive urine culture that warrants ABX therapy is defined as growth from catheter specimens > 50,000 CFU/mL, midstream > 100,000 CFU/mL, and suprapubic aspirate with any amount of growth. Urine culture and ABX susceptibility will be reviewed to determine opportunity for de-escalation or discontinuation of therapy.

Results: Results presented will discuss appropriateness of empiric ABX management for UTI and proportion of patients with negative urine culture or ABX sensitivities that warrant discontinuation or de-escalation of ABX therapy.
**Conclusions:** The findings from this study will help determine the need for antimicrobial stewardship intervention for improving ABX use. We hypothesize that the data will support the benefit of a pharmacist led urine culture follow-up collaborative practice program at our ED.
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May 16-18, 2022

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Organization: Nemours Children's Hospital
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Evaluation of the use of naltrexone for cholestatic pruritus

**Objectives:** Pruritus is a common symptom of liver disease and various treatments have been utilized to treat pruritus in patients with liver disorders, including ursodiol, cholestyramine, rifampin, and naltrexone. Opiate antagonists, including naltrexone, have shown efficacy in managing cholestatic pruritus. However, current literature surrounding the safety and efficacy of naltrexone for cholestatic pruritus is limited, especially in the pediatric population where wide variations in dosing have been described. The objective of this study was to describe naltrexone prescribing practices in pediatric and adult patients with cholestatic pruritus.

**Methods:** We conducted a single-center, retrospective chart review of patients with liver disease who received one or more doses of naltrexone from January 1, 2008 through July 31, 2021 for the management of cholestatic pruritus. We gathered information on naltrexone dosing, frequency, number of dose titrations, and duration of therapy. Additionally, elevations in liver function tests (defined as >2 times baseline values) and use of anti-pruritic agents before and after naltrexone initiation were collected to evaluate safety and place in therapy, respectively.

**Results:** Thirty-nine patients met inclusion criteria and 122 dosing regimens were used for analysis. The majority of patients were male (56.4%), ranging in age from 0.63 – 18.89 years of age, with the most common liver disease etiologies being biliary atresia (25.6%) and Alagille syndrome (20.5%), respectively. The median weight-based naltrexone doses were 1.45 mg/kg/DOSE (IQR, 0.84 – 2.81) and 1.86 mg/kg/DAY (0.97 – 3.37). The median flat doses were 25 mg/DOSE (12.25 – 50) and 50 mg/DAY (25 – 50). Once daily regimens were most commonly prescribed (61%) followed by twice daily dosing (36%). The median duration of therapy was 319 days (97.5 – 777.5). The median number of anti-pruritic agents used prior to naltrexone initiation compared to post-naltrexone initiation were 3 (2-4) and 4 (3-5), respectively. The most common elevated liver function tests (LFT) were total bilirubin and alanine aminotransferase occurring in 15% of patients, respectively.

**Conclusions:** Naltrexone dosing ranged around 1 mg/kg/dose once or twice daily with higher weight-based doses prescribed in younger and lower weight patients. Naltrexone was commonly added as a fourth-line agent and did not enable providers to discontinue other anti-pruritic therapies. There was a wide variety in duration of use ranging from months to years.
Additionally, naltrexone was well tolerated with the most common LFT elevation being seen in just 15% of patients. Large, prospective studies are still needed to assess the safety and efficacy of naltrexone for this indication.
Evaluation of the clinical impact of decreasing the maximum osmolarity of neonatal peripheral parenteral nutrition

**Objectives:** The objective of this study is to describe the clinical impact of lowering the peripheral parenteral nutrition (PPN) maximum osmolarity limit from 1000 mOsm/L to 900 mOsm/L in neonatal patients in two neonatal intensive care units.

**Methods:** This is an institutional review board-approved retrospective cohort study conducted in two neonatal intensive care units (NICUs). Patients were included if they were inborn to the two NICUs and received PPN for at least 3 consecutive days within the first 14 days of life. Patients were excluded if they required fluid restriction defined as an initial combined intravenous lipid emulsion and PPN order volume of less than 60 ml/kg/day. Data pertaining to patient demographics and PPN order components were collected via electronic medical record reports between August 9th, 2020 and September 30th, 2020 for the pre-implementation cohort with a PPN osmolarity limit of 1000 mOsm/L, and data were collected between October 1st, 2020 to January 3rd, 2021 for the post-implementation cohort with a PPN osmolarity limit of 900 mOsm/L. Data were evaluated to compare the ability of PPN to provide daily recommended macronutrient doses, daily recommended goal calories, and incidence of peripheral IV infiltrates between cohorts.

**Results:** A total of 200 PPN orders representing 57 patients were included for analysis, with 100 PPN orders and 25 patients in the pre-implementation cohort and 100 PPN orders and 32 patients in the post-implementation cohort. The final results will be recorded and results will be presented.

**Conclusions:** It is anticipated that this project will describe the clinical impact of lowering the PPN maximum osmolarity limit from 1000 mOsm/L to 900 mOsm/L in neonatal patients. These results can then in turn be used to optimize nutritional and safety outcomes.
Authors: M. Taylor, T. Villalobos-Fry, H. Kincaid, K.H. Wheatley; Lehigh Valley Health Network (LVHN), Allentown, Pennsylvania

Title: Evaluation of vancomycin prescribing in pediatric patients following implementation of a sepsis pathway and orderset

Objectives: In January 2020, Lehigh Valley Reilly Children's Hospital (LVRCH) implemented a pediatric sepsis pathway and orderset ensuring guideline-directed treatment. Vancomycin was recommended for pediatric patients who presented with sepsis and were previously healthy, had multiple medical conditions, or who were immunocompromised. The purpose of this study was to assess and compare vancomycin prescribing patterns prior to and following implementation of the pediatric sepsis pathway.

Methods: Retrospective chart review was performed of children aged 60 days to 17 years who presented to LVRCH and received intravenous vancomycin between July 1, 2019 and December 31, 2019 (pre-implementation) and between January 1, 2021 and June 30, 2021 (post-implementation). A planned subgroup analysis was conducted to assess the impact of COVID-19 on vancomycin use from July 1, 2020 to December 31, 2020.

Results: A total of 172 vancomycin courses were included in the final analysis. Nine courses (16.0%) were administered for sepsis during the pre-implementation period compared with twenty-one (31.8%) in the post-implementation period (P=0.04). Significant increases in orderset utilization were observed during the post-implementation and COVID-19 subgroup periods. Additionally, vancomycin prescribing in the children's emergency room increased during the post-implementation period (P=0.02). No significant differences were observed in vancomycin use during COVID-19 despite potentially higher acuity patients. Majority of courses across all study groups were discontinued within three days of initiation.

Conclusions: Significant increases in vancomycin prescribing for the indication of pediatric sepsis and orderset utilization were observed following implementation of the sepsis pathway. Despite an increase in vancomycin use for the indication of sepsis, the number of vancomycin courses did not significantly change between the pre- and post-implementation periods. Trough monitoring was performed within three days from initiation in almost half of the courses that were discontinued, which establishes an opportunity for stewardship efforts in preventing unnecessary monitoring. Future plans are to concentrate efforts on areas of highest prescribing,
address orderset utilization, and define scenarios where therapeutic drug monitoring is indicated.
Effect of the eat, sleep, console model of care on total morphine administration to narcotic or substance exposed infants

Objectives: Withdrawal symptoms of infants born with neonatal abstinence syndrome (NAS) have historically been treated with morphine utilizing the Finnegan Neonatal Abstinence Scale (FNASS), potentially resulting in unnecessary morphine exposure. Many hospitals have implemented an Eat, Sleep, Console (ESC) model of care, which maximizes parental supplied non-pharmacological treatment including skin-to-skin contact, on-demand feeding, and uninterrupted sleep. The purpose of this study was to determine if the ESC model of care decreased the amount of morphine doses per infant without increasing length of stay.

Methods: This retrospective, process improvement analysis compared substance-exposed infants with NAS born at WDH one year prior to ESC protocol implementation and one-year post-protocol implementation. The study included infants born at WDH with known neonatal narcotic or substance exposure and excluded infants with gestational age less than 35 weeks, no available bedside caretaker, or comorbid illnesses requiring specialized care. Primary outcomes included the number of morphine doses administered per infant, and average length of stay (ALOS); secondary outcomes include number of treatment days, percentage of infants requiring morphine, and maximum dose of morphine administered.

Results: Forty-five infants met criteria in the pre-implementation group, as compared to forty-four infants in the post-implementation group. After implementation of ESC protocol, the mean number of morphine doses per infant decreased a total of 98.5%, from 95 doses to 1.5 doses; average length of stay also decreased from 10.3 days to 6.6 days. Of the infants that received morphine, ALOS decreased from 18.6 days to 6.5 days. Nineteen infants (42%) required treatment with morphine using the FNASS as compared to two infants (4.5%) when using the ESC protocol. Pre-implementation, the maximum dose of morphine administered was 0.09 mg/kg, as compared to 0.04 mg/kg post-implementation.

Conclusions: When compared to the FNASS, the ESC protocol decreased the mean number of morphine doses per infant, as well as the ALOS. The percentage of infants with NAS...
requiring morphine also decreased, showing that previous treatment modalities may have resulted in unnecessary opioid exposure. The results of this study strongly support the use of the ESC model of care for the treatment of infants with NAS. More studies are needed to assess long-term effects of these results.
Conference Abstracts  
May 16-18, 2022

**Presenter Name:** Harmon, Andrea  
**Organization:** King's Daughters Medical Center  
**Category:** Pharmacokinetics  
**Day | Session | Room | Time:** Monday | 1 | Wild Rose A  | 1:30:00 PM

**Authors:** A. Harmon; L. Slone; L. Keeton; J. Sobnosky  
**Title:** Implementation and assessment of vancomycin area under the curve dosing and monitoring  
**Objectives:** The 2020 Infectious Diseases Society of America Vancomycin Dosing Guidelines now prefer area under the curve (AUC) dosing, with a target of 400 to 600 mg*hour/L, over trough only dosing for serious Methicillin Resistant Staphylococcus Aureus infections to improve efficacy while reducing the risk of nephrotoxicity. This study will assess the time to therapeutic vancomycin using a pharmacy protocol for AUC dosing compared to the previous trough-only dosing protocol. Secondary endpoints to be evaluated include adverse effects (i.e. nephrotoxicity), adherence to the AUC dosing protocol, and appropriate interpretation of AUC levels.

**Methods:** A retrospective chart review was conducted reviewing pre-implementation data in November 2021, and post-implementation data in March-April 2022. The vancomycin dosing protocol was updated, a vancomycin AUC dosing calculator was approved, and education was distributed to the providers, pharmacists, nurses, and phlebotomy staff in March 2022. Vancomycin AUC dosing was implemented on March 23, 2022. Fifty-six clinical records were obtained to evaluate pre-implementation data of our previous dosing protocol.

**Results:** Preliminary data revealed twelve out of fifty-six patients in the pre-implementation group developed an acute kidney injury while on vancomycin with a trough goal of 15-20 mcg/mL. The average time to goal trough in the pre-implementation group was 3.1 days (range 2-7 days). The post-implementation results will be presented.

**Conclusions:** It is anticipated that the institutional change from vancomycin trough-only monitoring to vancomycin AUC dosing will lower rates of nephrotoxicity and shorten the time to achieve therapeutic goals.
Efficacy and safety of a vancomycin dosing and monitoring protocol based on the area under the curve/minimum inhibitory concentration ratio at a community hospital

OBJECTIVE: The current American Society of Health-System Pharmacists' (ASHP) guideline for therapeutic monitoring of vancomycin recommends avoiding the use of vancomycin trough levels alone due to increased risks of nephrotoxicity. Based on these updated recommendations, an area under the curve/minimum inhibitory concentration (AUC/MIC) based vancomycin dosing protocol was implemented at our community hospital in October 2019. The purpose of this study is to assess the efficacy and safety of the vancomycin dosing and monitoring protocol when using AUC/MIC ratio-based dosing strategy in patients with serious suspected or culture-confirmed Gram-positive bacterial infections.

METHODS: A retrospective observational chart review of patients 18 years or older receiving vancomycin utilizing an AUC/MIC ratio-based dosing strategy from January 2021 to November 2021 was conducted. Using electronic medical health records, each chart was evaluated for demographic data, baseline characteristics, and vancomycin dosing protocol compliance including analytical data based on the Detroit Michigan Center (DMC) spreadsheet-based pharmacokinetic (PK) calculator. Descriptive statistical analysis will be conducted using Scipy Python module.

RESULTS: The primary objective is to measure the percentage of patients who meet the target AUC/MIC ratio at steady state (within 4 to 5 half-lives). The secondary objectives are to measure the time to reach the target AUC/MIC ratio, the effectiveness of the spreadsheet-based DMC PK calculator to predict a patient's optimal dosing regimen, and the percentage of patients who experience adverse effects such as nephrotoxicity.

CONCLUSIONS: It is anticipated that this study will highlight the efficacy of the DMC spreadsheet-based PK calculator by measuring the percentage of patients who meet the target AUC/MIC goal achievement with minimal risk of adverse events. Based on the results of this study, modifications may be made to the current protocol to improve efficacy and safety.
**Conference Abstracts**  
May 16-18, 2022

**Presenter Name:** Isaac, Robin  
**Organization:** Doylestown Hospital  
**Category:** Pharmacokinetics  
**Day | Session | Room | Time:** Wednesday | 6 | Empire B | 4:30:00 PM

**Authors:** R. Isaac, E. Song, E. Morgan; Doylestown Hospital, Doylestown, Pennsylvania

**Title:** Retrospective analysis of vancomycin pharmacokinetics in adult patients by body mass index classification

**Objectives:** Vancomycin has a narrow therapeutic index, necessitating individualized dosing to optimize therapeutic efficacy while minimizing toxicities. Prior studies have evaluated vancomycin pharmacokinetics in obese populations, but there remains limited data in underweight patients. The primary objective of this study is to examine the correlation between predicted and observed AUCs according to different BMI classifications. Secondary objectives will include descriptive evaluation of other pharmacokinetic parameters, such as volume of distribution and vancomycin clearance.

**Methods:** Medical records of adult patients at Doylestown Hospital who received vancomycin and had available steady state peak and trough vancomycin levels from July 2020 to June 2021 were retrospectively reviewed. Exclusion criteria included pregnancy, less than 48 hours of vancomycin therapy, unstable renal function, or renal impairment that would preclude scheduled dosing. Vancomycin levels and patient pharmacokinetic information were collected and analyzed by body mass index (BMI) classification subsets: subsets included BMI < 18.5 kg/m², BMI 18.5-24.9 kg/m², BMI 25-29.9 kg/m², and BMI of 30 kg/m² or greater. Correlation testing, descriptive statistics, and multivariable statistics were utilized for data analysis.

**Results:** Ninety patients were included in the trial with a weight range of 38 to 151.9 kg and a BMI range of 13.1 to 44 kg/m². Statistical analysis with Pearson's product-moment correlation test showed a correlation coefficient of -0.035 (p = 0.7439). The median Vd coefficient was 1.16 (IQR 1-1.3) for BMI < 18.5 kg/m², 0.95 (IQR 0.82-1.1) for BMI 18.5-24.9 kg/m², 0.89 (IQR 0.76-1.02) for BMI 25-29.9 kg/m², and 0.76 (IQR 0.6-0.84) for BMI 30 kg/m² and above.

**Conclusions:** There were no statistically significant differences in the primary outcome of correlation between predicted and observed AUC by BMI classification. Volume of distribution coefficient was increased for lower BMI's. Further analysis is ongoing in conjunction with a statistician.
Authors: Jon Jasko, PharmD; Jeff Quedado, PharmD Eric Likar, PharmD

Title: Comparing perioperative heparin dosing in transcatheter aortic valve replacement to strategies utilized in valve replacements requiring cardiopulmonary bypass at WVU Medicine's Heart and Vascular Institute.

Objectives: This study aims to investigate periprocedural unfractionated dosing strategies currently utilized in transcatheter aortic valve replacement (TAVR), their ability to achieve a therapeutic activated clotting time (ACT), and to assess their impact on procedural outcomes in comparison to published heparin dosing regimen utilized in surgical valve replacements requiring cardiopulmonary bypass.

Methods: This single-center retrospective chart review was conducted on patients undergoing either transcatheter aortic valve replacement (TAVR) or surgical aortic valve replacement (SAVR) requiring cardiopulmonary bypass at WVU Medicine Heart and Vascular Center. Surgical cases were excluded if patients were less than 18 years of age, systemically anticoagulated with any agent other than heparin, or were undergoing a repeat valve replacement. The primary outcome compared was the duration of time between procedural start to the first documented therapeutic ACT. This was defined as an ACT of greater than or equal to 250 seconds or 400 seconds for the TAVR and SAVR cohorts respectively. Secondary outcomes assessed the number of UFH doses administered prior to achieving a therapeutic ACT, the incidence of major bleeding events, use of blood products, and the use of perioperative reversal agents.

Results: Data collected on 250 cardiac surgery cases from February 2022 to December 2020 is currently being analysis and will be reported out during the Eastern States Conference.

Conclusions: To follow results and be presented during the Conference.
Conference Abstracts  
May 16-18, 2022

Presenter Name: Nicholson, May  
Organization: Riverside Health System  
Category: Pharmacokinetics

Day | Session | Room | Time: Monday | 1 | Wild Rose A | 1:15:00 PM

Authors: M. Nicholson, J. Compton, T. Sledge

Title: Evaluating effectiveness of two dosing strategies at achieving initial therapeutic serum levels of vancomycin in adult patients: comparing protocol-based dosing versus patient-specific pharmacokinetic/pharmacodynamics dosing

Objectives: This study is based on the guideline update in 2020 from the American Society of Health-System Pharmacists, Infectious Diseases Society of America, Pediatric Infectious Diseases Society, and the Society for Infectious Diseases Pharmacists for the recommendation of dosing vancomycin to target area under the curve to minimum inhibitory concentration (AUC/MIC) > 400 mg\(\text{h/L}\) rather than trough-based monitoring with typical target of 10-20 mg/L. The use of AUC/MIC to guide vancomycin therapy has shown to be a better predictor of vancomycin outcomes and reduction in safety events, such as nephrotoxicity. Transitioning to AUC-guided dosing is limited, specifically due to expense. Implementation of an institution developed dosing method would minimize the cost to the organization. The aim of this study is to evaluate the effectiveness of the current protocol-based dosing versus institution developed patient-specific pharmacokinetic/pharmacodynamics (PK/PD) dosing to reach initial therapeutic levels of vancomycin.

Methods: This is a single center quasi-experimental study with the aim to evaluate the effectiveness of using trough-based dosing per institutional protocol compared to AUC/MIC-based dosing using patient-specific PK/PD with expected improvement of reaching initial vancomycin levels in therapeutic range after implementation of the institution developed dosing method. Pharmacists will use a PK/PD Navigator within the electronic medical record (EMR), which houses the facility developed calculator to estimate AUC/MIC to determine vancomycin initiation and adjustments. Patient population include those at least 18 years old, received two doses of vancomycin or more, and have at least one vancomycin level obtained. Patients who were excluded were those in acute kidney injury or receiving any form of dialysis at vancomycin initiation. The primary outcome evaluated is the incidence of initial vancomycin levels in therapeutic range. Secondary outcomes will also be examined and reported to provide additional areas of focus for future research. Some secondary outcomes include hospital length of stay, days of vancomycin therapy, and incidence of acute kidney injury post-vancomycin initiation.
**Results:** Results showing the incidence of reaching therapeutic levels before and after implementation will be presented during the Eastern States Platform Conference.

**Conclusions:** The anticipated conclusion for this research is to demonstrate the increase in incidence of reaching therapeutic vancomycin levels using the Navigator compared to the previous dosing strategy. The utility of the data collected during this research will help direct the pharmacy department at Riverside Regional Medical Center in the use of the Navigator for initial vancomycin dosing as well as adjustments going forward.
Patel, Savan

Improving safety of cefepime dosing in the critically ill patient using a population pharmacokinetic approach

Conference Abstracts
May 16-18, 2022

Presenter Name: Patel, Savan
Organization: Robert Wood Johnson University Hospital Somerset, Somerville, NJ
Category: Pharmacokinetics
Day | Session | Room | Time: Monday | 1 | Wild Rose A | 2:00:00 PM

Authors: S. Patel, S. San Filippo, R. Panico, C. Adams, M. Rodricks, A. Siemińska, L. Kagan, L. Brunetti

Title: Improving safety of cefepime dosing in the critically ill patient using a population pharmacokinetic approach

Objectives: Therapeutic drug monitoring (TDM) of beta-lactams has emerged as a strategy to individualize regimens for critically ill patients. The main goal of TDM is to use appropriate concentrations of difficult-to-manage medications to optimize doses and clinical outcomes. Cefepime induced neurotoxicity (CIN) is a clinically significant side effect secondary to high doses of cefepime. The central hypothesis of this study is that aiming for a cefepime concentration above the minimum inhibitory concentration for 100% of the dosing interval and for a cefepime trough concentration of ≤20 mg/L will represent the best balance between microbiological/clinical efficacy and drug safety. The central hypothesis will be tested by pursuing two specific aims: 1) Define appropriate cefepime dosing strategies by utilizing population pharmacokinetic (PK) methods; 2) Evaluate cytokine/chemokine expression and its relationship with CIN.

Methods: This is an IRB-approved, prospective, PK study that includes critically ill adult patients receiving cefepime. The study team will identify adult patients who are admitted to the intensive care unit and are scheduled to receive cefepime therapy for a presumed duration of at least 48 hours. Eligible patients will have a member from the study team speak with the patient and/or patient representative to obtain written informed consent. Patients who consent will then have a total of 4 blood samples drawn with a cefepime trough and peak on days 1 and 2 of cefepime therapy. Blood samples will be spun using a centrifuge, and the plasma will be extracted and stored at -80°C. The study team has developed a liquid chromatography mass spectrometry assay to analyze the plasma samples and obtain the cefepime concentrations. A correlation will be assessed to determine the relationship of patient characteristics with the incidence of CIN. An exploratory analysis will also be conducted to identify potential biomarkers in the setting of CIN.

Results: A total goal of 12 patients will be included in this study. The study team has enrolled 9 patients so far and obtained cefepime concentrations for 5 patients. Of these available concentrations, 4 of the patients had cefepime trough levels >20 mg/L. Data on the time of cefepime administration and concentration measurement will be cross-checked and analyzed.
The cefepime concentrations will be used to construct a population PK model using the modeling software Monolix, and the model will be presented.

**Conclusions:** It is anticipated that this project will establish better understanding of PK targets to optimize efficacy and safety, the role of beta-lactam TDM in the critically ill population, and knowledge that will be extensible to future studies of functional biomarkers for CIN.
Pilot study of medication contribution to inpatient falls at two community hospitals

**Objectives:** Falls and fall-related injuries are significant public health concerns. In the hospital, falls are associated with increased length of stay, higher rates of discharge to institutional care, and increased use of healthcare resources. The current MedStar Health standard is to utilize the widely validated Morse Fall Scale to identify patients who may be at high risk for falls for prompt implementation of fall prevention guidelines. A potential gap in practice is that high fall risk medications are not included in the Morse Fall Scale despite being well-known to possibly influence falls. The purpose of this study is to characterize patients who fall, review these potential falls for association with high-risk medication use, and propose a more proactive medication-related fall reduction tool for pharmacist/nursing intervention.

**Methods:** An IRB-approved retrospective chart review was conducted for patients who had a fall reported from 08/01/2021 through 10/31/2021 at MedStar Union Memorial Hospital and MedStar Good Samaritan Hospital. Exclusion criteria included falls that occurred in an outpatient setting or emergency department, patients <18 years of age, and patients admitted for <12 hours. Data collected includes demographics, comorbidities, fall description, admission reason, discharge location, high fall risk medications administered within the last 12 hours, medication dosing, high fall risk conditions (i.e. hypotension, hypoglycemia), and Morse Fall Scale score. This information will be collected from RL Solutions reporting software and Cerner using the PowerInsight Reporting tool. Medications will be assessed for fall risk using the Agency for Healthcare Research and Quality (AHRQ) medication fall risk score.

**Results:** Descriptive statistics will be used for statistical analysis. Outcomes will include length of stay, time to fall from admission, average Morse score prior to fall, and average medication risk score. Outcomes will be used to look for trends between number of medications and medication classes in association with higher fall risk. Next steps include developing a tool for medication-related fall reduction. The study and results will be completed at the time of presentation.

**Conclusions:** Falls are common among hospitalized patients. This study will describe the medication trends of patients who fall to design a proactive tool in an attempt to reduce inpatient
medication-related falls. Potential limitations of the study include comparisons of fall rates between hospitals or units are highly susceptible to confounding by recording bias, possible MAR documentation errors, and the retrospective nature of the review.
Conference Abstracts  
May 16-18, 2022

**Presenter Name:** Fusco, Victoria  
**Organization:** MedStar Union Memorial Hospital  
**Category:** Practice Research  
**Day | Session | Room | Time:** Monday | 1 | Wild Rose B | 12:30:00 PM

**Authors:** Victoria Fusco, PharmD, Pharmacy Resident, MedStar Union Memorial Hospital; Erica Wilson, PharmD, Clinical Pharmacist, MedStar Good Samaritan Hospital; Allison Chlipko, PharmD, Clinical Pharmacy Manager, MedStar Union Memorial Hospital and MedStar Good Samaritan Hospital

**Title:** Pilot study of medication contribution to inpatient falls at two community hospitals

**Objectives:** Falls and fall-related injuries are significant public health concerns. In the hospital, falls are associated with increased length of stay, higher rates of discharge to institutional care, and increased use of healthcare resources. The current MedStar Health standard is to utilize the widely validated Morse Fall Scale to identify patients who may be at high risk for falls for prompt implementation of fall prevention guidelines. A potential gap in practice is that high fall risk medications are not included in the Morse Fall Scale despite being well-known to possibly influence falls. The purpose of this study is to characterize patients who fall, review these potential falls for association with high-risk medication use, and propose a more proactive medication-related fall reduction tool for pharmacist/nursing intervention.

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**Conclusions:** Falls are common among hospitalized patients. This study will describe the medication trends of patients who fall to design a proactive tool in an attempt to reduce inpatient falls.
medication-related falls. Potential limitations of the study include comparisons of fall rates between hospitals or units are highly susceptible to confounding by recording bias, possible MAR documentation errors, and the retrospective nature of the review.
Assessing vaccine hesitancy of adults ages 27-45 years towards Human Papillomavirus (HPV) immunizations

Objectives: The objectives of this study are to assess current awareness of HPV and the availability of an immunization against the virus, assess perceptions towards HPV and the HPV vaccine, and identify potential barriers of adults against receiving the vaccine.

Methods: This is a cross-sectional study that will evaluate the awareness and willingness of people ages 27-45 years are to get vaccinated against HPV. Inclusion criteria includes English-speaking people in a non-monogamous sexual relationship who are ages 27-45 years old. Those who are unable to read English, those outside of this age range, and anyone in a not mutually monogamous sexual relationship will be excluded. Participants will be recruited through a commercial survey sampling company - Qualtrics®.

Results: Descriptive and inferential statistical analyses will be conducted to evaluate differences in knowledge and beliefs about HPV vaccine by demographic characteristics. Alfa level of 0.05 will be adopted. Participants will receive an email with the 28-questionnaire survey which will provide consent. All responses will remain anonymous. Email addresses of the participants will not be collected to keep them anonymous. Demographics of interest that will be collected include gender, age, race/ethnicity, level of education, marital status, and religion. Surveys will be distributed by email through Qualtrics between February 2022 to March 2022. The survey questions are designed to assess participant knowledge of the HPV infection, potential long-term health complications, HPV vaccines, and perceptions that the participants have towards those vaccines.

Conclusions: This study will describe the perceptions and barriers people ages 27-45 years have towards HPV vaccination. This will provide information to improve best practices surrounding this age group and vaccination rates.
Conference Abstracts  
May 16-18, 2022

**Presenter Name:** Lee, Sally  
**Organization:** Inova Mount Vernon Hospital  
**Category:** Practice Research  
**Day | Session | Room | Time:** Wednesday | 5 | Empire B | 1:45:00 PM

**Authors:** S. Lee, T. Pho, K. Marge, L. Monroe-Duprey  

**Title:** Prevention of hypoglycemia in a community hospital

**Objectives:** The American Diabetes Association recommends hospitalized patients have less tight glycemic control and recommends against the use of mixed insulin due to the risk of hypoglycemia. Hypoglycemia (defined as a blood glucose (BG) level of less than 70 mg/dL) is a preventable event associated with increased mortality. A single-center, retrospective medication use evaluation at Inova Mount Vernon Hospital (IMVH) identified more than half of the 55 patients who experienced severe hypoglycemia (defined as a BG of less than 54 mg/dL) were on scheduled mealtime insulin or mixed NPH/Regular (NPH/R) insulin. The primary objective is to assess the impact of pharmacist interventions on insulin usage to prevent inpatient hypoglycemic events.

**Methods:** This is a prospective study of patients admitted at IMVH with active scheduled insulin lispro and NPH/R insulin orders between January through March 2022. Hold and dose adjustment parameters for mealtime insulin orders were added for blood glucose levels below 100 mg/dL and 120 mg/dL, respectively. Mixed insulin orders were separated into individual basal and mealtime insulin orders. Patients’ BG and insulin usage were reviewed and assessed daily from Monday through Friday until discharge. Patients who received insulin for hyperkalemia or had a length of stay of 2 days or less were excluded. Collected data included baseline characteristics, relevant past medical history, type of intervention, and insulin usage. The primary outcome is the incidence of hypoglycemic events in the post-intervention period compared with the pre-intervention period.

**Results:** The collected data will be recorded and results will be presented.

**Conclusions:** It is anticipated that this project will decrease the number of hypoglycemic events in hospitalized patients and demonstrate the role of hold parameters for scheduled mealtime insulin, avoiding the use of mixed insulin, and pharmacist-managed insulin orders.
Confident Abstracts
May 16-18, 2022

**Presenter Name:** Skoloda, Daniel  
**Organization:** The Johns Hopkins Hospital  
**Category:** Practice Research  
**Day | Session | Room | Time:** Monday | 1 | Wild Rose B | 1:15:00 PM

**Authors:** D. Skoloda, C. Dowd-Green, C. Burdalski, M. Patino, R. Stewart, S. Weinstein, J. Merrey, A. Bertram; Johns Hopkins Medicine, Baltimore, Maryland

**Title:** Perceptions of varenicline prescribing in psychiatric comorbidities

**Objectives:** In late 2016, the FDA removed the black box warning for “serious neuropsychiatric events” from the varenicline prescribing information following the results of the EAGLES trial. In 2020, the American Thoracic Society released a guideline that recommends varenicline as the preferred first line therapy for all patients, including those with psychiatric comorbidities. We aim to determine if these historic warnings still preclude the use of varenicline as first line therapy in this patient population.

**Methods:** Phase 1 of this study is a survey that was sent to providers in adult primary care clinics within Johns Hopkins Medicine to assess their utilization of varenicline in patients with and without psychiatric comorbidities. Phase 2 was a retrospective chart review of all patients who were seen in adult primary care clinics within Johns Hopkins Medicine from 1/1/17 to 12/31/20 who either had a diagnosis for tobacco dependence or were prescribed tobacco cessation therapy. Select comorbidity data for these patients was collected and cross referenced with the choice of tobacco cessation therapy that the patient received.

**Results:** Descriptive statistics will be used to report the findings of the survey. Odds ratios will be used to determine the likelihood of a patient with psychiatric comorbidities receiving varenicline as either first line therapy or used as part of a tobacco cessation treatment regimen.

**Conclusions:** It is anticipated that the results of this study will inform pharmacists to how to tailor interventions to increase compliance to evidence-based guidelines in the treatment of tobacco dependence.
**Objectives:** Hyperkalemia is a potentially life-threatening disorder occurring in 1-10% of hospitalized and 2-3% of emergency department patients. It occurs more commonly in patients with comorbidities. Although sodium polystyrene sulfonate (SPS) has been used for 60 years for the treatment of hyperkalemia, its efficacy has not been studied in large randomized trials, and its use in acute hyperkalemia is limited due to its slow onset. Furthermore, rare but severe colonic necrosis have been reported with SPS. Sodium zirconium cyclosilicate (SZC) is an inorganic zirconium silicate compound that selectively captures potassium in exchange for hydrogen and sodium. Although acute potassium lowering ability of SZC has been demonstrated in vitro and clinical settings against placebo, the use of one time dose of SZC in patients with hyperkalemia in hospitalized settings have not been evaluated against SPS. We hypothesized that a single dose of SZC would be non-inferior to SPS (one time or multiple doses) in reducing potassium levels 4 hours or later after its administration.

**Methods:** This was a single-center, retrospective chart-review of patients who received either a one-time dose of SZC or SPS for the treatment of hyperkalemia. Data were collected on demographics, medical history, admission medications, lab values, concomitant potassium lowering therapies, vital signs, additional doses of SZC or SPS, adverse events, and serum potassium values within 48-hour of study drug administration. The primary endpoint was the mean absolute reduction in first serum potassium value at least 4 hours after the study drug administration. The secondary efficacy endpoint included the need for additional potassium lowering therapy, percent of patients achieving normokalemia, and the cost of therapy. Safety endpoints included incidence of electrolyte abnormalities, hypoglycemia, hypokalemia, and colonic necrosis.

**Results:** The potassium lowering ability, represented as absolute reduction, of one time dose of SZC and SPS will be evaluated as primary outcome. For secondary outcomes, the need for additional potassium lowering therapy and sustained potassium lowering activity will be evaluated. Proportion of patients experiencing adverse events will be reported and feasibility of one time dose of sodium zirconium cyclosilicate and its economic impact will be assessed.
**Conclusions:** It is anticipated that our study will demonstrate the effectiveness and non-inferiority of SZC compared to SPS in reducing potassium levels in hospitalized patients with acute hyperkalemia.
Authors: V. Downs, J. Carpenter, A. Sumana, M. Lee

Title: Pharmacotherapy optimization for alcohol use disorder upon pharmacist recommendation and implementation within the VA population (POUR)

Objectives: Alcohol Use Disorder (AUD) is a very prevalent disease state among the veteran population. Studies have shown that 40% of veterans have a lifetime history of AUD. Unfortunately, medication assisted treatment (MAT) for AUD within VHA continues to be underutilized, with only 12% of patients with an AUD being treated with pharmacotherapy. Furthermore, many of the efforts for increasing AUD pharmacotherapy has been focused on treatment within the outpatient setting, rather than the inpatient setting. The primary aim of this study is to determine if there was an increase in the prescribing of AUD pharmacotherapy within the inpatient setting after the implementation of a pharmacy driven alcohol pharmacotherapy quality improvement initiative.

Methods: This was a single-center, quasi pre-post study conducted at the Washington DC Veterans Affairs Medical Center (VAMC). Patients included in the study were those admitted to the Washington DC VAMC internal medicine floors who presented with alcohol withdrawal syndrome or an alcohol-related primary admission between October 1st 2021 and January 31st 2022 or during the comparison period (October 1st 2020 to January 31st 2021). The primary endpoint was to evaluate the changes in the prescribing trends of AUD pharmacotherapy after the implementation of the alcohol pharmacotherapy quality improvement initiative. The AUD pharmacotherapy options that were assessed in this trial included: naltrexone, acamprosate, topiramate, disulfiram, and gabapentin. The results were analyzed using a multivariable logistic regression analysis that was adjusted for age, race, gender, liver function, and renal function. Some secondary endpoints that were also evaluated included the impact of the quality improvement initiative on relevant hospital metrics (Sud40 and ALC _Top) and pharmacy health factors.

Results: The number of AUD pharmacotherapy prescriptions prior to the onset of the quality improvement initiative will be compared to the number following the project, and results will be presented.

Conclusions: It is anticipated that this study will demonstrate the impact that clinical pharmacists can have on increasing the access to AUD pharmacotherapy for indicated patients within the inpatient setting.
Utilization of medications to treat alcohol use disorder at a Veterans Affairs medical facility

**Presenter Name:** Fedor, Emily  
**Organization:** Veterans Affairs of Connecticut Healthcare System  
**Category:** Psychopharmacology  
**Day | Session | Room | Time:** Monday | 2 | Wild Rose B | 3:00:00 PM

**Authors:** E. Fedor, A. Abelleira, K. Shadick, A. Douglass, C. Collantes, C. Madden

**Title:** Utilization of medications to treat alcohol use disorder at a Veterans Affairs medical facility

**Objectives:** Alcohol Use Disorder (AUD) is both a medical and psychological obstacle for a large number of our Veterans with at least 40% screening positive at some point in their lives.1 Pharmacotherapy in combination with psychotherapy can help patients reduce alcohol intake and ultimately achieve abstinence, however barriers may prevent use of these medications. Medications for alcohol use disorder (MAUD) may be underutilized in clinical practice, presenting an opportunity for pharmacists to provide medication education on the various options based on patients' individual needs. The purpose of this project is to evaluate the utilization of medications to treat alcohol use disorder and the impact of provider medication education at the Veterans Affairs Connecticut Healthcare System (VACHS).

**Methods:** The VA Academic Detailing Dashboard for AUD will be utilized to capture patients who should be considered for AUD pharmacotherapy, as of January 2022. Data such as, Alcohol Use Disorders Identification Test (AUDIT-C) score, current and past AUD medication trials, and status of remission, will be collected. A subset of patients with an AUDIT-C score of 8-12 from October 2021 through December 2021 were reviewed retrospectively to identify barriers to pharmacotherapy use. Pharmacist-led education regarding MAUD, importance of screening via AUDIT-C, and identified barriers will be provided to primary care and mental health prescribers in order to develop strategies to overcome barriers and increase prescribing when clinically appropriate. After providing pharmacist-led education to prescribers, the VA Academic Detailing Dashboard for AUD will be reviewed again in May 2022 to analyze for change in MAUD prescribing.

**Results:** The number and percentage of patients with AUDIT-C scores assessed as well as prescribing of MAUD will be recorded and results presented.

**Conclusions:** It is anticipated that this project will demonstrate the impact pharmacist-led education to providers has on prescribing rates and frequency of assessing patients at risk of AUD through the use of AUDIT-C.
Presenter Name: Granato, Caralyn  
Organization: Providence Veterans Affairs Medical Center  
Category: Psychopharmacology  
Day | Session | Room | Time: Monday | 2 | Wild Rose B | 3:30:00 PM

Authors: Caralyn A. Granato, PharmD; Justin C. Ellison, PharmD, BCPP

Title: Evaluation of the association between cannabis use and a measure of post-traumatic stress disorder symptom severity in a veteran population

Objectives: In 2019-2020, over 20% of Veterans ages 18-44 reported past-6-month cannabis use and data has shown that rates of cannabis use disorder are higher in Veterans with post-traumatic stress disorder (PTSD). As the prevalence of cannabis use increases, so does the need for understanding its effects on PTSD. While many Veterans, and some studies, endorse the benefits of cannabis use, other studies show worsening of PTSD symptoms. The purpose of this exploratory study is to find an association between cannabis use and symptom severity in PTSD, so that mental health providers are better able to discuss cannabis use within the Veteran population.

Methods: A retrospective chart review will be conducted using the VA Informatics and Computing Infrastructure (VINCI) database for Veterans at least 18 years of age who have PCL-5 scores entered into the patient chart at least one time from August 2019 through August 2020 and a substance use assessment on the same day. Veterans with an inpatient hospitalization within 3 months of rating scale administration will be excluded. Upon further chart review, it will be recorded whether the provider documented formulation and frequency of cannabis use, if the patient is actively engaged in psychotherapy, and if other substance use disorders are present. In addition, the results of PHQ-9 and AUDIT-C scales will be recorded if assessed during the same visit. To evaluate the association between cannabis use and PCL-5 scores, the mean scores will be compared between cannabis users and nonusers using a t-test. The secondary outcomes will be compared using descriptive statistics.

Results: Results will be presented at the Eastern States Conference in May of 2022.

Conclusions: It is anticipated that this project will assist mental health providers in discussing the effects of cannabis use within the Veteran population.
Experience with brexanolone for the treatment of postpartum depression

Authors: T. Nguyen, R. Bogdan, K. Rivers, E. Hernandez

Title: Experience with brexanolone for the treatment of postpartum depression

Objectives: Postpartum depression (PPD) affects up to 20% of women in the year following childbirth and is thought to be mediated by a rapid decline in progesterone after delivery. Brexanolone is an aqueous formulation of the progesterone metabolite allopregnanolone that is the only medication to be FDA approved for the treatment of PPD. This retrospective evaluation was conducted to assess the efficacy and safety of brexanolone use at UPMC Harrisburg, assure that all orders adhered to medical staff formulary restriction criteria, assess the Hospital's compliance with ZULRESSO REMS program elements, and quantify cost savings attributable to a novel approach to infusion bag admixture preparation.

Methods: This was a retrospective chart review of patients who received brexanolone for the treatment of moderate to severe PPD at UPMC Harrisburg between November 1, 2019 and July 31, 2021. Patient electronic medical records were utilized to collect de-identified information. Study endpoints included incidence of adverse events, change in Edinburgh Postnatal Depression Scale (EPDS) score from baseline, use of concomitant psychiatric medications, adherence to UPMC Harrisburg formulary restriction criteria (e.g., ordering provider, treatment location, diagnosis of PPD severity), compliance with ZULRESSO REMS elements, total brexanolone dose administered and number of brexanolone infusion bags dispensed.

Results: A total of 14 patients received brexanolone for the treatment of PPD at UPMC Harrisburg during the evaluation period. At baseline, patients had a median EPDS score of 21. Upon completion of brexanolone, patients were observed to have a 6-point median reduction in their EPDS score which was a 71% reduction from baseline. Six of 14 patients (43%) experienced an adverse drug event, with headache and infusion site pain observed in 4 (29%) and 3 patients (21%), respectively. Utilization was 100% compliant with institutional formulary restriction criteria and ZULRESSO REMS requirement elements. A novel process to prepare brexanolone infusions avoided use of an additional 12 vials which resulted in a cost avoidance of more than $80,000.

Conclusions: Brexanolone was observed to be safe and efficacious for the treatment of postpartum depression. All patients experienced improvements in their EPDS scores upon completion of treatment and all institutional as well as ZULRESSO REMS program
requirements were adhered to. The novel process to prepare brexanolone infusions was found to have significant cost avoidance.
Conference Abstracts  
May 16-18, 2022

**Presenter Name:** Norton, Arielle  
**Organization:** Veterans Affairs Connecticut Healthcare System  
**Category:** Psychopharmacology  
**Day | Session | Room | Time:** Monday | 2 | Wild Rose B | 3:45:00 PM

**Authors:** Norton A, Madden C; Veterans Affairs Connecticut Healthcare System (VACHS), West Haven, Connecticut

**Title:** Development and implementation of an acute agitation order set.

**Objectives:** The objective of this quality improvement project is to determine current prescribing trends of healthcare providers in inpatient psychiatry and the psychiatric emergency room for patients with acute agitation, standardize the medications used for acute agitation at the Veterans Affairs Connecticut Healthcare System (VACHS) through collaboration with the psychiatric providers, improve the efficiency of the order-verification process for these medications by developing an order set, and review the order set utilization. Agitation is a medical and psychiatric emergency, which can be commonly caused by alcohol or drug intoxication, psychiatric illness, and acute delirium. First-line therapy for agitation is prevention by targeting the underlying problem. In the acute, emergent setting, however, behavioral interventions and medications should be as accessible as possible, as the goal of therapy is to protect the patient and staff. Order sets in the Veterans Affairs electronic medical record improve the ease of medication ordering and pharmacy verification.

**Methods:** A retrospective chart review was conducted to assess current prescribing patterns of lorazepam, haloperidol, and diphenhydramine for veterans in the psychiatric emergency room and veterans admitted to the inpatient psychiatry ward at VACHS. Medication orders were only included if the indication for use was acute agitation. Data was analyzed and psychiatry providers were consulted and given the opportunity to provide feedback for the creation of the agitation order set. Following order set implementation, a second chart review was conducted to assess utilization and feedback was requested from both psychiatry providers and inpatient clinical pharmacists.

**Results:** Average time-to-verification for medication orders for acute agitation events was eight minutes prior to order set implementation. Average time-to-verification after utilization of the order set will be recorded and results will be presented.

**Conclusions:** The anticipated conclusion is that the use of an agitation order set will standardize the medications used in acute agitation events, improve time-to-verification, and be accepted by psychiatry and pharmacy staff.
Conference Abstracts
May 16-18, 2022

Presenter Name: Parker, Stephen
Organization: Gulf Coast Veterans Health Care System
Category: Psychopharmacology
Day | Session | Room | Time: Monday | 2 | Wild Rose B | 4:15:00 PM

Authors: Stephen Parker, PharmD, Michelle Richard, PharmD, BCPP. Gulf Coast Veterans Health Care System, Biloxi, MS.

Title: Development and implementation of long-acting partial opioid agonist injectable procedure at a Veterans Affairs Medical Center

Objectives: Establish a standard operating procedure and develop criteria for use for long-acting buprenorphine injection initiation and management to increase treatment options for Veterans with opioid use disorder (OUD).

Methods: The investigators will review current protocols for opioid-replacement therapy at this facility, treatment guidelines, and primary literature to determine the best practices for long-acting injectables (LAI) medication procedures. The procedures will be developed based on the information discussed in interdisciplinary meetings with nursing staff, medication manufacturer guidelines and recommendations, and input from pharmacy staff and prescriptive providers. Treatment protocol, exclusion criteria, and inclusion criteria will be developed based on provider feedback, clinical judgment, and information gathered. The proposed protocol will be presented to the Pharmacy and Therapeutics committee for approval before implementation. The buprenorphine dashboard and criteria for use will be utilized to determine eligible candidates for initiation once the procedure is approved. Staff that are responsible for prescribing, dispensing, and administering the injections will be educated on the new procedure and trained on proper administration techniques prior to implementation.

Results: Veterans being treated with opioid use disorder are required to follow-up with a provider frequently, about every 1-2 weeks, to refill oral medications and obtain appropriate labs (e.g., urine drug screen). A monthly injection would decrease the number of visits a Veteran has with a provider which allows the provider an opportunity to see more patients. By implementing a process for obtaining a buprenorphine injection, Veterans have more treatment options for opioid use disorder.

Conclusions: Providing access to a buprenorphine injection will reduce diversion and will increase adherence, outcomes, and treatment options for Veterans being treated for opioid use disorder.
Presenter Name: Rouvalis, Stephanie  
Organization: St. Vincent's Medical Center  
Category: Psychopharmacology  
Day | Session | Room | Time: Monday | 2 | Wild Rose B | 4:00:00 PM  

Authors: Stephanie N. Rouvalis, PharmD, Anne Lin, PharmD, BCPS  
Title: Evaluation of melatonin in reducing antipsychotic use in geriatric patients  

Objectives: The American Geriatrics Society Beers Criteria classifies antipsychotics as potentially inappropriate medications for older adults due to their anticholinergic effects, increased stroke risk, and further cognitive decline. However, antipsychotics are commonly used in geriatric patients in practice for several neurological disorders such as delirium, Alzheimer's and dementia. Melatonin may be a potential option to reduce antipsychotic usage in this patient population as it is an accessible medication, improves sleep, and lacks serious side effects. The purpose of this project is to evaluate melatonin usage in reducing antipsychotic use in geriatric patients at two hospitals who have added melatonin to their formulary since joining Hartford HealthCare: St. Vincent's Medical Center (SVMC) and The Hospital of Central Connecticut (HOCC). Melatonin usage will be compared between the two hospitals because HOCC has been a part of Hartford HealthCare for a longer period of time than SVMC.  

Methods: Medical records of patients who were admitted to either site between December 1, 2020 and June 30, 2021 and met an international classification of disease code related to dementia, delirium, symptoms of psychosis, acute agitation, or sleep were reviewed retrospectively. Patients were included if they were 65 years old upon admission, had a length of stay at least 48 hours, and were only on an antipsychotic inpatient. Patients on antipsychotics prior to admission or those chronically taking melatonin at home were excluded. The primary outcome was the decrease in total daily amount of antipsychotic usage at both sites. Secondary outcomes included the average dose of each individual antipsychotic, total daily dose of an antipsychotic if discharged on an antipsychotic, and melatonin discontinuation. Safety outcomes included incidence of cardiovascular events and changes in mental status using the Confusion Assessment Method (CAM) and Richmond Agitation Sedation Scale (RASS).  

Results: Preliminary results show that many antipsychotic orders were one time orders. The most common antipsychotics prescribed were quetiapine, haloperidol, and olanzapine. HOCC used more melatonin. There were several cases of patients discharged on new antipsychotics at both sites. The final results of the primary and secondary outcomes will be reported and presented.  

Conclusions: It is anticipated that the addition of melatonin to the hospital formulary may decrease use of antipsychotics for delirium/agitation in geriatric patients.
Revenue recovery and utilization review of pegfilgrastim in a multi-center comprehensive cancer care program of The Johns Hopkins Health System (JHHS)

Objectives: Within The Johns Hopkins Health System (JHHS), pegfilgrastim consistently ranks among the top five medications with the most payer claim denials. The average wholesale price (AWP) of a pegfilgrastim injection ranges from $4,700 - $7,700 per patient dose. The objective of this project is to characterize pegfilgrastim claim denials in order to develop strategies to decrease denials from third party payers.

Methods: Claim denials data from the electronic health record (EHR) was utilized to identify all pegfilgrastim (included all branded and biosimilar formulations of the on body injector and prefilled syringes) denials received based on claims submitted at The Johns Hopkins Hospital, Johns Hopkins Bayview Medical Center (JHBMC), and Sibley Memorial Hospital (SMH) between January 1st, 2020 to December 31st, 2020. A retrospective chart review was used to collect demographic and clinical data associated with the pegfilgrastim claim denials during the same time period. Denials for patients <18 years of age were excluded from this IRB approved study. Data was analyzed via Microsoft Excel.

Results: During the study period a total of 356 denials were identified out of 2,923 total doses of pegfilgrastim administered. These denials were associated with 167 unique patients with a mean of 2.1 denials per patient. The overall denial rate across all three hospitals was 12.2%. The denial rates were 15.4% for JHBMC, 12.5% for JHH, and 11.5% for SMH respectively. The pegfilgrastim formulation associated with the majority of the denials was the pegfilgrastim on body injector (Neulasta OnPro®), which represented 77% of the denials. The top three payers that accounted for the majority of denials were Medicare (A and B) at 15.2%, Cigna at 15.2%, and BlueCross BlueShield at 8.1%. The most common reasons for denials were lack of prior authorization on file, missing information needed for adjudication, and submission of duplicate claims.

Conclusions: This proof of concept project assessing denial data successfully captured the overarching trends within the revenue cycle for a specific medication. The results of this study will lead to operational and clinical changes that are anticipated to decrease the pegfilgrastim denial rate.
Presenter Name: Brown, Shawntel
Organization: Bayhealth Medical Center
Category: Quality Assurance/DUE
Day | Session | Room | Time: Monday | 1 | Wild Rose B | 12:45:00 PM

Authors: S. Brown, T. Mullen, C. Williams

Title: Assessing the impact of clinical pharmacist team members on medication related problems in an inpatient rehabilitation unit

Objectives: Inpatient rehabilitation facilities can optimize recovery and improve function after a recent hospital admission or surgery. However, the Centers for Medicare and Medicaid Services recently identified 30-day readmission following discharge from an inpatient rehabilitation facility as a national quality indicator. Previous studies proved that pharmacist interventions can help decrease the rates of readmission after discharge from an inpatient rehabilitation facility. This study assessed if a clinical pharmacist team member on the rehabilitation unit helped minimize potential harm from prescribed medications and improved patient outcomes.

Methods: This study was a prospective case-control descriptive study. The primary endpoint of this study was 30-day re-admission for the two months before and after the addition of a clinical pharmacist team member on the rehabilitation unit. Secondary endpoints included an evaluation of the potential harm avoided when a pharmacist made medication related problem recommendations. Descriptive statistics were used to analyze the data.

Results: 30-day re-admission before and after the addition of clinical pharmacist team member on the rehabilitation unit will be recorded and results will be presented.

Conclusions: It is anticipated that this study will determine the benefit of having a clinical pharmacist team member on the rehabilitation unit, and if any changes to the workflow are needed.
Clinical use of pharmacogenetics to prevent severe hypersensitivity reactions in an academic tertiary healthcare system

Authors: Vy Bui, PharmD1; James M. Stevenson, PharmD, MS, BCPP2; 1. The Johns Hopkins Hospital, Baltimore, Maryland; 2. Johns Hopkins University School of Medicine, Baltimore, MD

Title: Clinical use of pharmacogenetics to prevent severe hypersensitivity reactions in an academic tertiary healthcare system

Objectives: Clinical practice guidelines and drug labeling strongly recommend pharmacogenetic screening before starting certain medications due to the risk of severe adverse drug reactions. For example, patients carrying select HLA alleles are at higher risk of severe hypersensitivity reactions with abacavir (ABC), carbamazepine (CBZ), or oxcarbazepine (OXC). Failure to appropriately order or document pharmacogenetic tests may result in avoidable adverse drug reactions. The purpose of this study is to describe pharmacogenetic test ordering, documentation, and hypersensitivity incidence for patients initiated on ABC, CBZ, or OXC at a tertiary academic health system.

Methods: A retrospective chart review was conducted on eligible patients that were initiated on ABC, CBZ, or OXC between July 1, 2016 and August 1, 2021. Each medical record was assessed to determine if the appropriate pharmacogenetic test was ordered before initiation of the medication, what laboratory performed the testing, where the test result was documented, and whether a hypersensitivity reaction occurred. Patients initiated on CBZ or OXC with documented Asian ancestry were prioritized for review as they are at the highest risk for developing hypersensitivity reactions. Data was collected using REDCap and descriptive analyses were performed using Microsoft Excel.

Results: A total of 60 patients were included in the analysis with 20 from each medication cohort. The patient population was 53% male, mean age 39 years, and 33% Asian, 25% Black, 18% Caucasian, and 21.7% other. Healthcare providers ordered the indicated pharmacogenetic test for 90% of patients initiated on ABC. In 20 patients with documented East or Southeast Asian ancestry initiating CBZ or OXC, the indicated pharmacogenetic test was ordered only once. Pharmacogenetic tests were not ordered for patients of other ancestries initiating CBZ or OXC. Testing was primarily performed in-house and results were documented in the "Labs" or "Media" section of the electronic health record 68% and 63% of the time, respectively. The mean test turnaround time was 6 days. No patients on any medication were found to carry the high-risk HLA allele. No hypersensitivity reactions were reported.
**Conclusions:** While appropriate pharmacogenetic testing is ordered for the majority of patients starting ABC, providers rarely order testing for patients of East or Southeast Asian ancestry initiating CBZ or OXC. Interventions should be pursued to encourage ordering pharmacogenetic testing in high-risk patients. Inconsistencies among test result documentation may pose a challenge for providers and implementation of clinical decision support.
**Conference Abstracts**  
May 16-18, 2022

**Presenter Name:** Canales, Gisela  
**Organization:** Huntington Hospital - Northwell Health  
**Category:** Quality Assurance/DUE  
**Day | Session | Room | Time:** Poster

**Authors:** G. Canales, PharmD; J. Fiebert, Pharm.D., BCPS, BC-ADM, BCGP

**Title:** Analysis of hypoglycemic events in patients with diabetes admitted to a community hospital

**Objectives:** Inpatient hypoglycemia, defined as a blood glucose value < 70 mg/dL, is associated with a number of adverse outcomes including increased mortality. A majority of hypoglycemic episodes are found to be preventable. The American Diabetes Association (ADA) Standards of Care recommends implementation of an institutional hypoglycemic management protocol and a plan for preventing and treating hypoglycemia for each patient. The purpose of this analysis is to review hypoglycemic episodes for compliance with the health system hypoglycemia treatment protocol

**Methods:** A retrospective chart review was performed over a 2-month period on hospitalized patients with diabetes who experienced a hypoglycemic episode of < 70 mg/dL. Exclusion criteria include patients who do not have a diagnosis of diabetes. Data collected include age, blood glucose values, comorbid conditions, hemoglobin A1c, type of diabetes, medications prior to and during admission, renal function, nutritional status, and admitting diagnosis. Hypoglycemic events were assessed for compliance with the health-system treatment protocol. IRB approval was not needed for this quality initiative.

**Results:** A total of 61 patients were reviewed for hypoglycemia, and 88 hypoglycemic events were identified. Results from the retrospective analysis showed that approximately 59% (n = 52) of hypoglycemic events did not follow system hypoglycemia protocol. Key issues identified include no documentation of the hypoglycemic event (41%), hypoglycemia protocol not utilized (28%), and patients did not receive the correct treatment according to the protocol for their clinical status (20%). Educational in-service sessions were provided after the study period to nursing staff regarding optimizing hypoglycemic management and documentation.

**Conclusions:** Based on our analysis of hypoglycemic events in patients with diabetes over a 2-month period, the majority of hypoglycemic events in our institution did not follow system protocol. This analysis identified the need for better compliance to system protocol and additional opportunities to address hypoglycemia in particular.
Retrospective analysis of electrolyte repletion through an electronic orderset in medical-surgical patients at a teaching, academic medical center

Objectives:
Normal serum electrolyte levels are important to maintain physiologic functions. Appropriate repletion of lower than normal serum electrolyte levels can prevent complications, and utilization of strategies like protocols or ordersets have been shown to improve patient outcomes and clinician satisfaction. However, there is sparse data on utilization of these strategies in the non-critically ill population. Analyzing our institution's practices in this subset of patients may lead to implementation of improvements that can have a positive impact on patient care.

Methods:
Retrospective chart review of patient medical records who received electrolyte repletion from the medical/surgical electrolyte orderset during a two-month period were reviewed. Baseline characteristics, electrolyte(s) ordered, administration time, serum levels of the administered electrolyte(s), electrolyte-altering medications further defined in the study were captured and aggregated onto an Excel document. Baseline characteristics included age, sex, and comorbidity(s). Pertinent electrolyte(s) included for analysis were: potassium, magnesium, calcium, and phosphate.

Results:
The number of appropriate repletion utilizing the orderset, as well as the mean serum electrolyte level(s) will be analyzed and presented at Eastern States.

Conclusions:
Repletion of serum electrolyte(s) is crucial to minimize patient complications, and this retrospective analysis of our institution's orderset utilization will highlight opportunities to improve the prescribing of electrolyte replacement, leading to improved patient care.
Conference Abstracts
May 16-18, 2022

Presenter Name: Chow, Karissa
Organization: The Johns Hopkins Hospital
Category: Quality Assurance/DUE
Day | Session | Room | Time: Wednesday | 6 | Wild Rose B | 3:15:00 PM

Authors: Karissa Chow, Pharm.D., Brandon Trollinger, Pharm.D., BCPS, BCTXP, Dannielle Brown, Pharm.D., BCPS

Title: Implementation of a pharmacist-driven protocol to optimize diagnosis and treatment of iron deficiency in admitted patients with chronic kidney disease

Objectives: The 2012 KDIGO Clinical Practice Guideline for Anemia in Chronic Kidney Disease (CKD) recommends intravenous (IV) iron repletion in patients with CKD only if transferrin saturation (TSAT) is $\leq 30\%$ and ferritin is $\leq 500$ ng/mL, while the 2013 KDOQI commentary states repletion could be considered if TSAT is $\leq 30\%$, even if ferritin is $> 500$ ng/mL. Subsequent studies demonstrated potential benefit of IV iron repletion with higher ferritin cutoffs, leading to increased diagnostic and treatment variability in this population. We previously identified low screening rates, and undertreatment of iron deficiency in those screened, in admitted patients with CKD at The Johns Hopkins Hospital. The purpose of this follow-up study was to design and assess the benefits of a pharmacist-led protocol to optimize the identification and treatment of iron deficiency in this patient population.

Methods: This non-randomized, prospective study examined the effects of pharmacist interventions on the screening and treatment of iron deficiency in patients with CKD admitted to a single academic medical center between January 1, 2022, to February 28, 2022. Adult patients with CKD were included if admitted to an internal medicine or transplant nephrology service. Patients were excluded if pregnant or had a diagnosis of hemophilia or sickle cell disease. A protocol for inclusion, screening, and treatment was created and subsequently provided to pharmacists with educational sessions. Iron deficiency was defined in accordance with the 2012 KDIGO Guideline. Data collected via REDCap included demographics; CKD stage including dialysis dependence; length of stay; blood transfusions; iron studies; the formulation, dose, route, and duration for all iron repletion agents; acceptance of pharmacist recommendations; and amount of time to complete intervention. Data analysis will be conducted using Stata Statistical Software v.17.

Results: The frequency of patients tested for iron deficiency, the characterization of their iron studies, frequency of acceptance of pharmacist recommendations, and percent of patients treated will be reported. Iron repletion strategies will be characterized by iron therapy route, total elemental dose, and duration of therapy. Results of this intervention will be compared to our pre-intervention study data. The feasibility of the protocol will also be assessed through the
percent of eligible patients with completed interventions, and the amount of time required for completion.

**Conclusions:** It is anticipated that the study results will underline the benefit of a pharmacist-led protocol to optimize the identification and treatment of iron deficiency in patients with CKD admitted to The Johns Hopkins Hospital.
Authors: Karissa Chow, Pharm.D., Brandon Trollinger, Pharm.D., BCPS, BCTXP, Dannielle Brown, Pharm.D., BCPS

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percent of eligible patients with completed interventions, and the amount of time required for completion.

**Conclusions:** It is anticipated that the study results will underline the benefit of a pharmacist-led protocol to optimize the identification and treatment of iron deficiency in patients with CKD admitted to The Johns Hopkins Hospital.
Impact of a Reduced Patient to Pharmacist Ratio Pilot Study on Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) Scores

Objectives: Studies have suggested that pharmacists and pharmacy students have a positive impact on improving Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) scores related to medications. A reduced patient to pharmacist ratio is hypothesized to increase HCAHPS scores related to medication communication by allowing decentralized pharmacists more time for clinical interventions including patient education. A month-long pilot study was conducted at Northern Light Eastern Maine Medical Center which reduced the patient to pharmacist ratio from 90:1 to 50:1.

Methods: HCAHPS scores for the pilot floor were retrospectively collected prior to and after June 2021, the pilot month. The pharmacist educated patients on high-risk medications or any newly started medication identified by medication reconciliation. Secondary outcomes included monthly meds to beds enrollment, 30-day readmission rates for the patients receiving care on the pilot floor, and number of monthly documented pharmacist interventions on all floors.

Results: Pre- and post-pilot HCAHPS scores from the medication communication domain, communication about indication, and communication about side effects were compared using a one-sample t-test which yielded P-values of 0.33, 0.48 and 0.25, respectively. The number of documented pharmacist education interventions increased during the pilot month to 33 from an average of 2 monthly during the months preceding the pilot. Reporting limitations prevented investigators from determining the total number of pharmacist interventions from individual floors.

Conclusions: Deploying an additional decentralized pharmacist increased pharmacy involvement in patient education opportunities. Post-pilot HCAHPS scores demonstrate a potential effect of a reduced patient to pharmacist ratio.
Conference Abstracts  
May 16-18, 2022

Presenter Name: DeAssis, Joseph  
Organization: Virtua Health  
Category: Quality Assurance/DUE  
Day | Session | Room | Time: Tuesday |  3 | Wild Rose B |  1:45:00 PM

Authors: Joseph DeAssis, PharmD, Jeanmarie S. Perch, PharmD, BCPS, Benson Aningalan, PharmD, BCPS

Title: Evaluation of hypoglycemia during sliding scale insulin administration

Objectives: Despite its frequent use, the American Diabetes Association (ADA) recommends against the use of sliding scale insulin due to poor glycemic control and more frequent hypoglycemic events. Additionally, the Institute for Safe Medication Practices (ISMP) has published guidelines for insulin use, which reports safety issues with this strategy. The purpose of this study is to evaluate the safety of sliding scale insulin protocols within a five hospital health system.

Methods: This is a retrospective, observational study including a chart review of 200 patients administered an insulin sliding scale regimen from January 1, 2021 through June 30, 2021 across the health system. The primary endpoint is the number of patients who experienced at least one hypoglycemic event (serum glucose < 70 mg/dL) while on a sliding scale insulin protocol. Secondary endpoints include the average number of hypoglycemic events in patients who experienced at least one hypoglycemic event, percentage of hypoglycemic events treated according to protocol, and number of patients who received incorrect doses of insulin.

Results: Among 200 patients included in this analysis, 45 patients (22.5%) experienced at least one hypoglycemic event. Of the 45 patients who experienced hypoglycemia, a total of 85 hypoglycemic events were reported for a mean number of 1.9 events per patient. Three hypoglycemic events (3.53%) were adherent to the institution hypoglycemia protocol per documentation. Of all patients included in this project, incorrect sliding scale doses were administered in 35 (17.5%) patients.

Conclusions: The data suggests that patients on an insulin sliding scale regimen may experience hypoglycemic events. As a result, opportunities exist to optimize protocol adherence to both hypoglycemia treatment and insulin administration.
Optimization of perioperative antimicrobial prophylaxis in surgical patients at a large, tertiary academic medical center

Authors: Danielle Famularo, PharmD, Erica Liu, PharmD, BCPS, William Vincent III, PharmD, BCCCP, Karrine Brade, PharmD, BCPS, AQ-ID, BCIDP, Kiersten Pasternak, PharmD, BCPS

Title: Optimization of perioperative antimicrobial prophylaxis in surgical patients at a large, tertiary academic medical center

Objectives: Surgical site infections (SSIs) are one of the most common causes of hospital-acquired infections, leading to increased morbidity, mortality, and financial burden. Prior to this quality improvement (QI) initiative, our institution lacked standardization of preoperative antibiotic dosing, intraoperative redosing, perioperative Medication Administration Record (MAR) hold administrations, and antibiotic selection in patients with beta-lactam allergies. The purpose of this initiative is to improve surgical antimicrobial prophylaxis in the perioperative phase of care.

Methods: This QI initiative utilized the institute of Healthcare Improvement model for improvement through plan-do-study-act (PDSA) cycles. A workgroup of key stakeholders developed institutional guidelines for intraoperative antibiotic redosing. In addition, antibiotic weight-based dosing in surgical preoperative order sets was updated in our electronic health record (EHR) to align with recommendations from clinical practice guidelines. A report was further developed to identify patients with MAR hold antibiotics in the perioperative phase of care. Lastly, patients ordered for alternative preoperative antibiotics, i.e. clindamycin, were assessed for appropriateness of therapy in the setting of a beta-lactam allergy.

Results: Baseline results from September 2021 demonstrate that 80% of patients received appropriate weight-based antibiotic doses and 64% of patients had appropriate intraoperative redosing of antibiotics. At baseline, 52.3% of inpatients with antimicrobials on MAR hold had either a delay in therapy or lapse in administration. By February 2022, 90.3% of patients received an appropriate antibiotic weight-based dose, and 81% of patients had appropriate redosing of antibiotics intraoperatively. MAR hold compliance increased to 91.3% as well.

Conclusions: Our results suggest a positive trend towards improvement in perioperative antimicrobial prophylaxis at our institution. As we continue to optimize our process measures, we hope to demonstrate continuous improvement and sustainability in our QI initiative efforts.
Analysis of missing doses reported with cart-fill vs. automated dispensing cabinets

Presenter Name: Haught, Madison
Organization: Beckley Veterans Affairs Medical Center
Category: Quality Assurance/DUE
Day | Session | Room | Time: Wednesday | 5 | Wild Rose A | 12:30:00 PM

Authors: M. Haught, D. Poe, P. Huffman; Veterans Affairs Medical Center (VAMC), Beckley, West Virginia

Title: Analysis of missing doses reported with cart-fill vs. automated dispensing cabinets

Objectives: To evaluate the effectiveness of dispensing interventions used in the Beckley Veterans Affairs Medical Center.

Methods: Cart-fill was the only way medications were dispense. For about 80 days, medications were dispensed solely through automated dispensing cabinets (ADCs) in the inpatient ward, excluding ICU and nursing home. Hybrid Cart-fill with ADC medication dispensing was initiated after ADC only. Missing dose reports from May 5, 2021 through December 25 were collected retrospectively and reviewed to determine if reported missing dose was a true missing dose.

Results: The total number of true missing doses before, during, and after ADC dispensing were 72 out of 276 (26%), 583 out of 1077 (54%), 141 out of 203 (69%), respectively.

Conclusions: The number of missing doses reported became more accurate as the ADC was implemented, concluding that the increased use of the ADC improved medication dispensing.
Presenters: Hayashi, Taeka
Organization: Wilkes Barre VA Medical Center
Category: Quality Assurance/DUE
Day | Session | Room | Time: Wednesday | 5 | Wild Rose A | 1:15:00 PM

Authors: T. Hayashi, J. Miller, M. Betti; Veterans Affairs Medical Center (VAMC), Wilkes Barre, Pennsylvania

Title: Impact of telehealth on patient satisfaction in the pharmacist-led outpatient mental health clinic during the coronavirus disease 2019 pandemic

Objectives: The objective of this research is to evaluate the impact of telehealth on patient satisfaction in the pharmacist-led outpatient mental health clinic during the COVID-19 (Coronavirus Disease 2019) pandemic.

Methods: Patients diagnosed with a mental health disorder and had a scheduled appointment with the pharmacist-led outpatient mental health clinic between November 2021 – February 2022 were identified. Patients were asked during their scheduled telehealth appointment whether they would agree to complete a voluntary 5-question survey regarding their telehealth experience. Survey questions were adapted from Hyung-Youl Park et al. study's questionnaire, which encompassed questions related to ease of use, quality of interaction, reliability, satisfaction, and future use. Patient responses were collected and analyzed. Data collection and storage was completed by the Wilkes-Barre Veterans Affairs Medical Center pharmacy resident and supervising clinical pharmacists. Data was collected in a Microsoft Excel spreadsheet.

Results: 96 patients were surveyed. The majority of the patients were male (86.5%) and were greater than 50 years of age (83.3%). Additionally, 93% of the patients were encountered via phone appointments (TLCP) and 7% encountered via video appointments (VVC or VA Video Connect). 96.88% agreed with the statement â€œI would like to continue to use telehealth services in the futureâ€; 98.96% agreed with â€œOverall, I am satisfied with this telehealth experienceâ€; 80.21% agreed with â€œI believe I was able to express myself effectively during this telehealth visit.â€; 94.79% agreed with â€œI believe I was able to express myself effectively during this telehealth visit.â€ 80% of patients ranked ease of use of telehealth technology to be a 4 or 5 on a scale of 1 (uncomfortable) to 5 (comfortable). 100% of patients who ranked a 1-3 for the ease of use survey question were of an older age bracket (greater than 50 years of age).

Conclusions: Overall, patients were satisfied with the telehealth experience and were agreeable to future telehealth appointments in the pharmacist-led outpatient mental health clinic.
Authors: Sai Karwande, PharmD; Danielle Schulingkamp, RPh, BCPS, BCCCP

Title: Compliance with Updated Treatment Guidelines for the Management of Chlamydia and Gonorrhea

Objectives: The aim of this research project is to determine hospital wide compliance with the new sexually transmitted infection treatment guidelines established by the Centers for Disease Control and Prevention.

Methods: This study was conducted as a retrospective chart review utilizing data from July 24th, 2021 - February 28, 2022. Qlik®, an analytics and data integration platform, was utilized to compile an initial data list for review. All adult, non-pregnant patients who were treated for chlamydia or gonorrhea within the emergency department or hospital were included. A designated pharmacist reviewed the treatment/intervention to assess compliance with the updated CDC STI treatment guidelines. Additionally, the pharmacist reviewed any documentation justifying alternative treatment if applicable. Data was collected, stored, and analyzed using Microsoft Excel®.

Results: The preliminary results had a total of 20 patients in the chlamydia treatment group and 19 patients in the gonorrhea treatment group. Baseline characteristics were similar across groups as most subjects were treated for chlamydia and gonorrhea simultaneously. Six out of the twenty (30%) patients in the chlamydia treatment group and three out of nineteen patients in the gonorrhea treatment group had antibiotic allergies or intolerances. 84% of patients received appropriate treatment for chlamydia while 79% of patients received appropriate treatment for gonorrhea.

Conclusions: The preliminary results of this study suggest a high rate of compliance with the updated CDC STI treatment guidelines when managing chlamydia or gonorrhea. While the results show that most patients are being managed appropriately, there clearly remains room for improvement. The establishment of a hospital protocol could assist providers in determining appropriate dosing and duration of antibiotic therapy as these were the two factors that varied most often.
Authors: Sopheaktra Kong, PharmD; Jordan Koloski, PharmD; Erickson Maala, PharmD; Leslie Fang, PharmD; Kevin Horbowicz, PharmD, BCPS

Title: Reducing the Number of Missing Medications at a Tertiary Academic Medical Center

Objectives: The objective of this project is to decrease the rate of missing medication requests (MMR) from five to two per 10-patient days by June 30, 2022.

Methods: Institutional Review Board approval was not required for this quality improvement (QI) project. A workgroup comprised of pharmacy staff was established to identify gaps in current processes. Bi-weekly reports were ran starting May 2019 collecting the cumulative number of MMR sent via the electronic health record (EHR) to pharmacy by nursing staff. MMR were sorted by medication, formulation, and patient location. External factors (e.g. drug shortages) were tracked to help explain variation in data. The Institute of Healthcare Improvement QI model was used to conduct this initiative. Process maps and fishbone diagrams were completed to characterize the current state of the problem. Change concepts were plotted on an impact-effort matrix to prioritize interventions and implemented via Plan-Do-Study-Act (PDSA) cycles. Data was represented over time in run and statistical control charts using Microsoft Excel.

Results: Baseline rate of MMR since May 2019 was five per 10-patient days. PDSA cycles one and two focused on calcium gluconate (CG) and intravenous (IV) phosphate compounds, two of the most common missing medications. Interventions such as automated dispensing cabinet (ADC) stocking significantly decreased the number of MMR for both CG and IV phosphate compounds and significantly decreased time to administration for CG; however, there was no statistically significant change in the outcome metric. PDSA cycle three focused on EHR messaging and nurse education to improve communication regarding missing medications. These interventions resulted in a significant reduction of the outcome metric. PDSA cycle four standardized labeling and delivery storage locations of compounded oral medications. Data regarding this intervention is still being collected.

Conclusions: Medication-specific process improvements such as stocking of ADCs have significantly reduced the number of MMR for respective medications. Additionally, better delineating the definition of a missing medication and improving communication with nursing staff has shown a significant reduction in the outcome metric. Further interventions are needed to reach the objective set for reduction of missing medication requests.
Improving the discharge medication reconciliation process for an inpatient hematologic malignancy consult service by utilizing a pharmacy-facilitated workflow

Objectives: There is limited data regarding medication reconciliation (MR) in the hematologic malignancies population and pharmacist involvement in discharge medication reconciliation (DMR). This initiative aims to identify the current gaps in the DMR process within the hematologic malignancies consult service at Sibley Memorial Hospital, in addition to decreasing the number of medication discrepancies that occur during DMR and improving physician satisfaction with the DMR process.

Methods: This single-center pilot quality improvement initiative takes place from November 2021 to May 2022 by using the Plan-Do-Study-Act (PDSA) method. First, current gaps in the DMR process and physician satisfaction with the current workflow were quantified through a survey sent to stakeholders involved with the hematologic malignancies service. Baseline quantity of medication discrepancies on the DMR were established via retrospective chart review; medication discrepancies included, but were not limited to, incorrect duration of therapy, incorrect dosing, inappropriate ordering of refills, and premature discontinuation of therapy for oral chemotherapy, anti-infective prophylaxis, supportive care agents, and chronic care medications. The hematologic malignancies service then implemented a pharmacist-facilitated workflow that involved the clinical pharmacist on the consult service pending the DMR in the electronic medical record for the discharging physician to review and sign.

Results: The number of discrepancies on the DMR and physician satisfaction before and after the new pharmacist-facilitated workflow was implemented will be recorded. Results will be analyzed and presented using descriptive statistics.

Conclusions: It is anticipated that this project will increase the accuracy of the DMR for patients discharged from the hematologic malignancies consult service, providing a safer transition of care at discharge. In addition, it is also projected that physician satisfaction with the DMR process will improve with the new pharmacist-facilitated workflow. If successful, this workflow may prove beneficial to other inpatient services.
Implementation of a Standardized Post-Cesarean Delivery Order Set Utilizing Multimodal Analgesia to Reduce Inpatient Opioid Use

Objectives: Studies have shown that one in three hundred opioid-naïve patients exposed to opioids post cesarean section (C-section) will become chronic opioid users. Implementation of a scheduled non-narcotic multimodal analgesia order set can provide adequate pain relief while limiting inpatient opioid use to only as needed. Use of multimodal analgesia also helps prevent opioid related side effects. Multiple studies have shown that utilizing multimodal analgesia post cesarean delivery reduces inpatient opioid usage while still providing adequate pain relief.

Methods: A standardized multimodal analgesia order set for pain management following C-section was created utilizing ACOG guidance documents. Opioid naïve patients admitted for either a scheduled or emergent C-section were identified using ICD-10 codes. Prior to data collection, IRB approval was obtained from the institution. Electronic data from the pre-implementation phase was collected from a three-month period. Education was provided to pharmacy staff regarding changes to verifying the new order set and alternating medication administration times. For nursing staff and providers, educational materials were created to provide information on implementing the new protocol. This protocol was implemented for all C-section patients starting March 1, 2022. Post-implementation data will be collected through the month of March.

Results: Pre-implementation data included reviewing a total of 108 patients over a three-month period. Of these patients, 70 received opioids during their admission (64.8%), with a median of 30 morphine milliequivalents (MME) administered. This excluded any opioids administered in relation to an epidural. The average time to the first dose of opioids following delivery was 25.5 hours (range 3-51 hours), and the mean pain score for all patients was 4.7/10 with 40 patients experiencing a severe pain score of greater than 8 (37%). At discharge, 83 patients were prescribed opioids (76.8%) with an average number of 13 tablets. Post-implementation data is being collected and the results will be presented.

Conclusions: It is anticipated that this project will demonstrate that the implementation of a standardized multimodal analgesia order set will reduce inpatient opioid use in the post-
cesarean delivery setting. This practice may be reproducible in other surgical settings to reduce opioid use when implemented based on best practice measures.
Impact of implementation of a standardized alcohol withdrawal protocol in non-ICU patients

**Objectives:** The American Society of Addiction Medicine 2020 treatment guideline for alcohol withdrawal recommends individualized benzodiazepine dosing strategies based on severity of withdrawal. Management of alcohol withdrawal at Sinai Hospital is provider-specific and often leads to inconsistencies in how patients are treated. This study assessed treatment outcomes before implementation of the standardized alcohol withdrawal protocol.

**Methods:** A retrospective cohort evaluation was conducted for patients presenting to Sinai Hospital with moderate to severe alcohol withdrawal and managed using the current order-set between 6/1/2021-9/1/2021. The primary outcome was the proportion of patients who were successfully treated; defined as prevention of post-admission complications, including seizures and delirium tremens. Secondary outcomes included total benzodiazepine dose required, total duration of benzodiazepine treatment, and proportion of patients with any documented respiratory rate less than 12 breaths per minute. Data was analyzed using descriptive statistics.

**Results:** Total of 63 patients were included in the analysis, of which 47(74.6%) were male. 60% of patients were classified as having severe alcohol withdrawal during their hospital stay. All patients were treated with a symptom-triggered strategy, however 32% of patients were also treated with a fixed-dosing regimen. With regards to the primary outcome, only 2 patients developed post-admission complications. The median cumulative benzodiazepine dose required was 7.5 mg and the median duration of benzodiazepine therapy was 3 days. Total of 7 patients were noted to have a documented respiratory rate less than 12 breaths per minute.

**Conclusions:** Based on the data analysis, implementation of a new order-set with guideline-driven recommendations for front loading, fixed-dosing regimen, and adjunctive treatment will facilitate standard practice amongst providers, while allowing flexibility to choose the most appropriate dosing strategies for each patient.
**Conference Abstracts**
**May 16-18, 2022**

**Presenter Name:** O'Neill, Patricia  
**Organization:** New York Harbor Healthcare System (Brooklyn VA)  
**Category:** Quality Assurance/DUE  
**Day | Session | Room | Time:** Tuesday | 3 | Wild Rose B | 12:45:00 PM

**Authors:** Mikesha Williams, PharmD, Nino Marzella, PharmD, and Patricia O'Neill, PharmD

**Title:** Evaluation of associated adverse events to mRNA COVID-19 vaccination in a veterans affairs healthcare system

**Objectives:** Overall, this study will provide more insightful information on the incidence and establish future development for safer vaccine concerns regarding adverse reactions to the mRNA COVID-19 vaccine. Furthermore, this analysis can determine a correlation for patients previously infected with COVID-19 infection based on reported adverse events that impacted the severity of symptoms.

**Methods:** A retrospective chart review will be conducted to determine the overall incidence of adverse events reported from to the mRNA COVID-19 vaccine in the Veteran population. The analysis will evaluate patients that were identified as either COVID-19 positive and/or COVID-19 antibodies positive that were determined prior to receiving the vaccine showed any correlation with the development of a greater incidence and/or severity of a reported adverse event. The VISN COVID Dashboard will identify patients who underwent COVID-19 testing between March 1, 2020 to June 1, 2021. Reported adverse events which are included; however, not limited to are the following: fever, chills/rigors, headache, joint and muscle and/or body pain or aches, fatigue, nausea, vomiting, diarrhea, abdominal pain, and rash (excluding the reactions of the immediate type of pain described as the local area around the injection site post administration). A rating scale for (mild, moderate, severe) will be implemented to evaluate the severity of symptoms. Descriptive statistics will be utilized to analyze this data.

**Results:** This study is currently ongoing and does not have complete results at this time. Results are projected to be completed prior to platform presentation.

**Conclusions:** As this is research in progress, conclusions will be made following data analysis. This will be completed prior to presentation.
Medication use evaluation: remdesivir in patients with coronavirus disease 2019 infection at a teaching community hospital

**Authors:** Jahnavi Patel, PharmD; Maryam Moghimi, PharmD. BCPS

**Title:** Medication use evaluation: remdesivir in patients with coronavirus disease 2019 infection at a teaching community hospital

**Objectives:** Remdesivir (RDV) is an adenosine analog RNA polymerase inhibitor which is FDA approved for treatment of coronavirus disease 2019 (COVID-19) positive patients aged ≥ 12 years old and weighing ≥ 40 kg. In January 2022, FDA expanded RDV use for non-hospitalized patients with mild-to-moderate COVID-19 who are at high risk for progression to severe COVID-19. According to NIH and FDA, MedStar developed COVID-19 treatment and prevention guideline which recommends RDV for two groups of patients: 1) maximum five days of therapy in patients with COVID-19 symptoms for < 10 days, requiring increase use of supplemental oxygen from baseline with inadequate improvement in respiratory function but does not require high-flow oxygen, mechanical ventilation, or extracorporeal membrane oxygenation, 2) three days of therapy in absence of alternative antiviral or monoclonal antibody for patients who are hospitalized for non-COVID-19 related conditions, with mild symptoms of COVID-19 within 7 days, who do not require increased oxygen from baseline, but have high risk of progression to severe COVID-19 infection. RDV use is contraindicated in patients with alanine transaminase (ALT) > 10 times of upper nor

**Methods:** This study is a retrospective chart review of patients with laboratory confirmed COVID-19 who received at least one dose of RDV between October 2021 to January 2022. Data collection includes age, weight, creatinine clearance, ALT, respiratory status, duration of COVID-19 symptoms prior to admission, and duration of RDV therapy. The primary outcome is the compliance rate to MedStar COVID-19 treatment and prevention guideline criteria. Patients with inappropriate use of RDV will be stratified based on their characteristics. The secondary outcomes are the cost analysis of RDV use and clinical outcomes.

**Results:** Results will be presented

**Conclusions:** will be presented
Optimization of alerts related to anticoagulation in the electronic ordering system and the effect on duplicate anticoagulant orders

**Objective:** Anticoagulants are high-risk medications that are being used on a steadily increasing basis. It is estimated that anticoagulant-related errors are associated with approximately 8.3% of all medication-related errors and increase the risk of death by 20%. Optimization of anticoagulant use is essential to high-quality care, patient safety, and minimization of adverse events. This continuous process improvement project aims to reduce inappropriate anticoagulant use by reducing therapeutic duplications.

**Methods:** A retrospective, comprehensive review of anticoagulant use and prescribing patterns was used to identify trends in data and areas of opportunity for improving inpatient anticoagulant use. Implemented strategies to improve utilization of these medications has included the development of guidance documents directed towards appropriate use for both pharmacists and providers, training and education for pharmacy staff, and the development of an electronic notification that is triggered upon pharmacist verification of multiple active anticoagulant orders that will be used to identify potentially inappropriate use of these medications. Upon alert notification, electronic health records are accessed to review current active medications and evaluate whether this duplication is clinically appropriate.

**Results:** The data to be presented will include a pre- and post-analysis with a primary outcome of the number of true anticoagulant duplications and a secondary outcome assessing the override rate of alerts associated with these orders.

**Conclusions:** It is expected that this research will assist with improving the appropriate use of anticoagulant medications and reduce the overall rate of duplications.
Conference Abstracts
May 16-18, 2022

Presenter Name: Rumley, Julia
Organization: Dartmouth Hitchcock Medical Center
Category: Quality Assurance/DUE
Day | Session | Room | Time: Tuesday | 3 | Wild Rose B | 12:15:00 PM

Authors: J. Rumley, E. Dodge, H. O'Rourke, G. Plaia, T. Harkness

Title: Biologic administration technique: the impact of the specialty pharmacist

Objectives: As experts in the treatment of complex disease states, specialty pharmacists are in a unique position to educate and monitor patients on a variety of therapies, including injectable biologics therapies. Of the services provided by specialty pharmacists, biologic injection teaching has become increasingly important as the effectiveness of these therapies is reliant on long-term patient adherence. The purpose of this quality improvement project was to develop quality metrics specific to TNFα inhibitor injection therapies and to standardize intervention documentation at Dartmouth-Hitchcock Specialty Pharmacy.

Methods: Standardized questions on patient comfort with self-injection, confidence with correct administration, confidence with preventing and treating injection site reactions, and overall satisfaction with therapy were developed for inclusion in specialty pharmacist-led consultations. Clinical specialty pharmacists involved in providing clinical consultations to patients on injectable TNFα inhibitor therapies were trained on use of the standardized questions and intervention documentation. Collected data consisted of standardized question use, patient responses to standardized questions, and intervention documentation. The number of documented interventions in the clinical management platform between October 18, 2021 and March 30, 2022 was compared to those documented between October 18, 2020 and March 30, 2021.

Results: Out of 203 patients who opted-in to specialty pharmacist-led consultations, 134 patients were administered the standardized questions on patient comfort and confidence with self-injection. Compared to the 2 interventions that were documented in TNFα inhibitor therapy-related consultations between October 18, 2020 and March 30, 2021, 12 interventions were documented during the study period. In the new-to-therapy consultation group, recommending in-person injection teaching and providing administration technique instructions were among the most documented pharmacist-led interventions. Counseling on injection site reaction management and prescriber consultation were most frequently reported as pharmacist-led interventions during 1-month and 6-month follow-up consultations. Feedback from staff on barriers to standardized question use and intervention documentation included time constraints in-clinic and perceived lack of necessity for patients with a long history of using TNFα inhibitor therapies.
Conclusions: The increase in documented interventions resulting from this project revealed the numerous ways in which specialty pharmacists assist patients with biologic administration technique. Further investigation is necessary to fully capture the quantity of specialty pharmacist-led interventions made during patient care consultations.
Pharmacist Intervention to Improve Venous Thromboembolism Prophylaxis Prescribing

**Author:** Adam J. Scala, PharmD., Joseph A. Berndsen PharmD.

**Title:** Pharmacist Intervention to Improve Venous Thromboembolism Prophylaxis Prescribing

**Objective:** Venous thromboembolism (VTE) is a common in hospital diagnosis and the risk increases with certain conditions and age. The American Society of Hematology recommends that health systems utilize risk assessment models to help stratify patients based on risk for VTE to guide decision making around prescribing VTE prophylaxis (VTEp). The purpose of this quality improvement initiative is to identify whether risk stratification by pharmacists using the Padua Prediction Score can improve rates of appropriate VTEp prescribing.

**Methods:** A single-center retrospective, pre- post- analysis was conducted in patients admitted to a hospital medicine service to evaluate implementation of a pharmacist-driven VTE risk assessment. Pre-intervention patients received standard VTE risk stratification and pharmacologic VTE prophylaxis prescribed by a primary service on admission. Post-intervention patients received standard primary service VTE risk assessment on admission followed by pharmacist VTE risk assessment and pharmacologic prophylaxis recommendations within 48 hours of admission. The primary outcome was the rate of appropriate VTE prophylaxis prescribing. Secondary outcomes include pharmacologic choice for VTE prophylaxis and rate of recommendation acceptance.

**Results:** A total of 100 patients received pharmacist VTE risk assessment. Following application of exclusion criteria, 56 patients remained eligible for risk stratification using the PADUA score assessment. Of the patients included, 83.9% of patients were prescribed VTE prophylaxis appropriately. Risk stratification identified 38 high risk and 18 low risk patients. All high risk patients appropriately received VTE prophylaxis while 50% of low risk patients received VTE prophylaxis. Pharmacist intervention was accepted for all patients. Primary and secondary outcomes to be presented.

**Conclusions:** Preliminary data indicates prescribers tend to over prescribe VTEp for low risk patients. Acceptance of pharmacy recommendations indicates an opportunity to better incorporate risk assessment tools in the admission process. Future efforts will focus on identifying the ideal method with consideration for pharmacist-drive assessment or incorporation into order sets or other decision support tools in the electronic health record.
Conference Abstracts
May 16-18, 2022

Presenter Name: Smith, Nicole
Organization: Riverside Regional Medical Center
Category: Quality Assurance/DUE
Day | Session | Room | Time: Wednesday | 5 | Wild Rose A | 12:45:00 PM

Authors: Nicole Smith, PharmD, PGY1 Pharmacy Resident; Jason Ferrell, PharmD, BCPS; Judd Compton, PharmD, MS, BCPS; Tyler Sledge, PharmD, BCPS

Title: Measuring success of a continuous renal replacement therapy implementation from a pharmacy perspective

Objectives: Continuous Renal Replacement Therapy (CRRT) has increasingly been the chosen form of renal replacement in critically ill and hemodynamically unstable patients with acute kidney injury (AKI) or end-stage kidney disease (ESKD) in comparison to intermittent hemodialysis. CRRT is a valuable modality for the care of patients with indications for hemodialysis who are too hemodynamically unstable to tolerate the physiologic and hemodynamic stresses of intermittent hemodialysis (IHD). Riverside Regional Medical Center (RRMC) will be implementing CRRT protocols, including separate protocols for anticoagulation with heparin or citrate, calcium replacement for patients receiving citrate, and antibiotic dose adjustments upon CRRT initiation. Onsite training was provided for nursing staff, pharmacy staff, and ordering providers regarding expectations and workflows of CRRT modality. In this research, the evaluation of whether pharmacy specific CRRT education improves understanding, evaluation of the implementation of pharmacy created-nurse driven CRRT protocols, and analysis of outcomes for future quality improvements of CRRT protocols will be documented to allow for future optimization

Methods: A cohort retrospective review of patients over a period of 6 months will be completed. CRRT patients will be identified retrospectively and analyzed based upon the appropriate adjustments as outlined in the CRRT protocols. Prior to implementation, pharmacy team members will be provided education on appropriate antibiotic CRRT dosing and new CRRT order sets. Pharmacy was also provided a more conducive education session to address expected roles in CRRT medication orders and to discuss any perceived barriers. Pharmacy team education will be evaluated via a questionnaire prior to education and again at the conclusion of education

Results: The CRRT patients with protocol implementation are currently being evaluated and results will be recorded and presented

Conclusions: It is anticipated that the evaluation of the implementation of a pharmacy created-nurse driven CRRT protocol will obtain data for pharmacist assessment and future interventions, leading to quality improvements and optimization of CRRT protocols
Implementación y impacto de un programa de monitoreo de anticoagulación oral liderado por farmacéuticos en un centro médico académico

**Autor:** Ja'Miera Stuart, PharmD; Adetokunbo Adedokun, PharmD, MPH

**Título:** Implementación y impacto de un programa de monitoreo de anticoagulación oral liderado por farmacéuticos en un centro médico académico

**Objetivos:** La reducción de los efectos de los anticoagulantes ha sido la prioridad en los objetivos de seguridad del paciente. El objetivo de este estudio es evaluar la adecuación del tratamiento con anticoagulantes orales directos (DOACs) y anticoagulantes orales por vía intravenosa (VKA) antes y después de la implementación de un programa de monitoreo liderado por farmacéuticos. El objetivo es optimizar el tratamiento con anticoagulantes orales y reducir el número de eventos de sangrado y/o tromboembolismo.

**Métodos:** Este estudio de un solo centro se llevó a cabo en dos etapas: una revisión retrospectiva de las historias clínicas y un análisis prospectivo después de la implementación de un programa de monitoreo de anticoagulación liderado por farmacéuticos. Una revisión retrospectiva se llevó a cabo para evaluar la adecuación del tratamiento con DOACs y VKAs en pacientes admitidos al hospital entre julio 1, 2021 y septiembre 30, 2021. El programa fue implementado en diciembre de 2021. Entre diciembre 1, 2021 y febrero 28, 2022, se evaluó el tratamiento con DOACs y VKAs después de la implementación del programa. Los pacientes mayores de 18 años que recibieron al menos dos dosis de un DOAC o un VKA fueron incluidos en este estudio. La adecuación del tratamiento con DOACs se determinó por edad, peso, creatinina sérica y interacciones de medicamentos. La adecuación del tratamiento con VKAs se evaluó comparándolo con el protocolo del hospital. Los resultados para los eventos de sangrado y tromboembolismo se analizaron como adecuados.

**Resultados:** Los resultados finales se registrarán y presentarán.

**Conclusión:** Se espera que los pacientes admitidos después de la implementación del programa de monitoreo tengan un aumento significativo en el número de tratamientos adecuados en comparación con los pacientes que fueron admitidos antes de la implementación del programa.
Conference Abstracts  
May 16-18, 2022

Presenter Name: Timmons, Kezia  
Organization: Salem Veterans Affairs Medical Center  
Category: Quality Assurance/DUE  
Day | Session | Room | Time: Tuesday | 3 | Wild Rose B | 2:00:00 PM

Authors: Kezia Timmons, PharmD; John Minchak, BS, PharmD, MBA, BCPS, BCGP; Jennifer M. Bowyer, PharmD

Title: Prevalence of vitamin B12 deficiency in veterans with type II diabetes on metformin

Objectives: An association between vitamin B12 deficiency and chronic metformin use has been proven and referenced in reputable guidelines. Per package insert, patients on metformin should have serum vitamin B12 evaluated at minimum every 2 to 3 years. Vitamin B12 related disorders can significantly decrease quality of life by having to cope with pain, increased pill burden to manage effects, and increased risk for hospitalizations. Veterans with type II diabetes are a high-risk population of concern due to the intersection of elderly age and chronic metformin usage; thus, may warrant more frequent testing to prevent vitamin B12 related disorders. The objective of this study was to investigate vitamin B12 deficiency among the veterans treated for type II diabetes at Salem VA Medical Center (SVAMC).

Methods: This was a single-center, retrospective cohort, chart review study. Five-thousand ninety subjects were included who had a documented diagnosis of type II diabetes and an active prescription for metformin from September 2018 to May 2021. The outcomes analyzed included prevalence of vitamin B12 deficiency and frequency of vitamin B12 labs drawn. Vitamin B12 deficiency was defined as vitamin B12 <200 pg/mL, borderline deficiency as <400 pg/mL, and without deficiency ≥400 pg/mL, per institution values.

Results: The average age was 69±10 years with greater than 40% of patients within the age range of 65 to 74 years old. About 96% of the patients were males and 74% were white. Of 5090 patients, 1323 (26%) had a serum vitamin B12 lab drawn. Prevalence of deficiency was ~6%, borderline deficiency was ~36%, and without deficiency was 58%.

Conclusions: The results of this study suggest a gap in care, as only about one-fourth of veterans have been screened for vitamin B12 status within the recommended time frame. The prevalence of vitamin B12 deficiency is approaching 50%, and this value is likely understated due to low frequency of screening. It appears there is not enough knowledge and aptitude regarding management of vitamin B12, so there is ample room for improvement. Cost of the vitamin B12 lab at SVAMC is only $5.49, which is much less than a possible neuropsychiatric hospitalization, chronic neuropathy treatment, or correction of other symptoms of vitamin B12 deficiency. Utilization of Clinical Pharmacist Practitioners in the primary care setting could play a key role in promoting patient-centered preventative care.
Impact of pharmacist-managed review of positive urine cultures for patients discharged from the emergency department

Authors: Toobah Wali, Connie Shah, Meryn Sweet

Title: Impact of pharmacist-managed review of positive urine cultures for patients discharged from the emergency department

Objectives: Culture follow-up programs in the emergency department (ED) that involve pharmacists can improve antibiotic management, reduce the time to intervention, and ensure initiation of appropriate antimicrobial therapy. Currently at Chester County Hospital (CCH), culture results for discharged ED patients are routinely reviewed by nurses. ED pharmacists are available to be consulted on a case-by-case basis by providers and nurses for antimicrobial decision-making following positive culture results. The objective of this study is to integrate pharmacist-driven antimicrobial stewardship activities into the routine ED discharge culture review process for urine cultures and evaluate the impact of expanded pharmacy clinical services at a 309-bed, acute care community hospital.

Methods: A protocol for treatment of urinary tract infections (UTI) was developed based on current guideline recommendations and CCH's antibiogram. This protocol served as a reference when reviewing positive urine culture results to standardize antimicrobial decision-making. A retrospective chart review was conducted on discharged patients with positive urine culture results from 4/1/2021 to 7/1/2021. Pharmacist-led review of cultures was implemented in January 2022, and a subsequent prospective chart review is being performed on patients with a positive urine culture post-discharge. Patients less than 18 years of age, admitted to the hospital, lost to follow-up after 3 contact attempts within seventy-two hours of intervention, or discharged to an acute care facility (e.g., inpatient psychiatric center) were excluded. The primary endpoint is comparing pre- and post-protocol implementation outcomes in time from positive urine culture result to time of follow-up completion. Secondary endpoints are time from culture result to review, appropriate antibiotic regimen upon discharge prior to culture results, and appropriate antibiotic regimen upon discharge after culture results.

Results: The full dataset will be analyzed and results will be included in the presentation. When comparing pre- and post-implementation data, it is predicted that pharmacist involvement in the discharge culture review process will reduce the time to initiating appropriate empiric antimicrobial therapy. In addition, improved compliance to current urinary tract infection guideline recommendations with pharmacist involvement is expected.
Conclusions: It is anticipated that this project will demonstrate a role for a pharmacist-driven ED discharge culture review process in order to improve antimicrobial stewardship efforts and compliance with adherence to evidence-based guidelines in the treatment of urinary tract infections. In addition, identification of provider prescribing practices and trends of antimicrobials in the ED is anticipated.
White, Logan

Enoxaparin – review of pharmacist driven protocol

Conference Abstracts
May 16-18, 2022

Presenter Name: White, Logan
Organization: Penn State Health Milton S. Hershey Medical Center
Category: Quality Assurance/DUE
Day | Session | Room | Time: Poster

Authors: Logan White, PharmD; Kim Keefer, PharmD, BCCCP, BCPS; Ashley Quintili, PharmD, BCCCP, BCPS;

Title: Enoxaparin â€“ review of pharmacist driven protocol

Objectives: Objective: The objective of this retrospective study is to determine the effectiveness of a pharmacist-led protocol for enoxaparin dose adjustments based on anti-Xa levels across different patient groups. Patient groups include critically ill patients admitted to an ICU, obesity (BMI ≥ 35 kg/m²), low body weight (LBW) (≤ 50 kg), AKI (increase in SCr ≥ 0.3 mg/dL within 48 hours or ≥ 50% within 7 days or urine output of ≤ 0.5 mL/kg/hr for ≥ 6 hours), CrCl ≤ 30 mL/min, treatment of pulmonary embolism, and signs of acute bleed. The results of this study will be used to validate the protocol, determine the level of monitoring required in each patient group, and guide further protocol implementation.

Methods: Methods: This retrospective study included patients who had an anti-Xa level ordered by a pharmacist from January 1, 2019 to September 30, 2021. Any patients with COVID-19 infection, those on prophylactic enoxaparin dosing, those less than 18 years old and those with incorrectly timed anti-Xa levels were excluded. The primary outcome was the attainment of a therapeutic anti-Xa level (0.6-1 units/mL) measured after 3.5 to 6.75 hours of the 3rd dose of therapeutic enoxaparin. Secondary outcomes were the number of interventions needed to reach therapeutic anti-Xa levels, and number of pharmacist recommendations accepted by providers.

Results: Results: Of 411 patient encounters evaluated, 291 were included in the study. 137 patients (47.1%) were found to have initial anti-Xa levels not within therapeutic range. LBW was found to be a statistically significant predictor of initial out-of-range anti-Xa, with 75% of patients not in therapeutic range (p=0.004). This was maintained after adjusting for ICU status and dose (p=0.006). With 60% of patients not in therapeutic range initially, AKI was found to be a significant predictor after adjusting for ICU status (p=0.037), but not after adjusting for both ICU status and dose (p=0.066). All 4 patients with signs of acute bleed had anti-Xa levels outside of therapeutic range (p=0.048), however this variable was unable to be included in the logistic regression analysis. Dose adjustment recommendations were made for 93 patients. 44 patients eventually had therapeutic anti-Xa levels, with 35 of them therapeutic after just 1 dose adjustment.

Conclusions: Conclusion: At our institution, almost half of patients ordered anti-Xa levels by pharmacists were not within therapeutic range with initial dosing of enoxaparin. This study
validates the continuation of the pharmacist driven protocol, specifically highlighting the need for anti-Xa monitoring in patients with LBW, AKI, or acute bleed.
Evaluating the impact of integrating pharmacists into the transitions of care services

Previous studies have shown that inconsistent care coordination post-discharge leads to increased hospital readmission rates. Transitions of care pharmacists play an essential role in patient care when transferring from inpatient to outpatient setting. In one study, follow-up phone calls by pharmacists increased patient satisfaction, resolution of medication-related problems and fewer return visits to the emergency department. Therefore, pharmacists can greatly contribute to the transitions of care team by performing medication reconciliation, medication counseling, patient education and follow-up. The Center for Medicare and Medicaid Services (CMS) has also imposed financial penalties because of high readmission rates in 2012 as a means of maximizing patient care needs during admission. Several studies have shown that pharmacist-led transitions of care (TOC) services improve medication safety and decrease hospital readmission rates.

Methods: The list of daily patient discharges is obtained from case management and the TOC pharmacist screens them for inclusion and exclusion criteria. Patients must be 18 years and older, discharged with 5 or more medications or have one or more disease states listed in the centers for Medicare and Medicaid in order to be enrolled in the intervention arm. The exclusion criteria include altered mental status, obstetrics patients, patients who leave the hospital against medical advice and end-of-life or palliative care patients. The intervention group receives the TOC pharmacist services including discharge counseling, medication reconciliation and disease state counseling. The primary outcome of this study is 30-day all-cause readmission rate. The secondary outcomes include self-reported medication adherence, number of medication discrepancies identified, and number of medication discrepancies resolved at discharge. The primary outcome will be analyzed using a chi square test.

Results: A total of 18 patients are currently enrolled in the study. Ten patients are enrolled in the intervention arm and eight patients enrolled in the control arm. To date, there are no readmissions in either of the study arms. Complete results will be analyzed and presented at the conference.

Conclusions: It is anticipated that the involvement of pharmacists in the transitions of care services will reduce 30-day readmission rates.
Conference Abstracts
May 16-18, 2022

Presenter Name: Almendras, Cassandra
Organization: UMass Memorial Medical Center, UMass Chan Medical School
Category: Transitions of Care
Day | Session | Room | Time: Wednesday | 5 | Wild Rose B | 1:30:00 PM

Authors: Cassandra Almendras, PharmD; Elizabeth Radigan, PharmD, BCPS; Allison Forni, PharmD, BCPS, BCCCP; Marisa O'Brien, PharmD, BCPS; Jaclyn Breeds, PharmD; Stephanie Glennon, PharmD

Title: Inpatient pharmacist impact on enrollment in an outpatient pharmacy meds to beds program in a pilot unit

Objectives: Implementation of medication delivery services by outpatient pharmacies across the country has grown with goals to improve patient outcomes, increase adherence to newly prescribed medications at hospital discharge, and reduce hospital and emergency department reutilization. The UMass Memorial Medical Center (UMMMC) meds to beds program began in 2020 during the initial COVID-19 surge. The program's focus is to provide safe and cost-effective therapy to patients at discharge by facilitating access to medications. Over the past year, the program at UMMC has an average fill rate of 18% with significant differences between units (ranging from 6-79%). Despite recent enhancements to the electronic health record (EHR) functionality, fill rates for many inpatient units remain below 15%. This represents a substantial opportunity for growth of a service that contributes to patient safety and satisfaction as well as provider satisfaction and quality. The objective of the study is to increase awareness, enrollment and fill rate through the UMMC meds to beds program through teamwork with an inpatient pharmacist and pharmacy resident in a pilot unit.

Methods: Two medical-surgery pilot units were identified to implement educational strategies targeting three groups: nurses, providers, and pharmacy team members. Education strategies to promote the program include endorsement of a feature within the EHR to enroll patients, live education sessions, and program advertisement. Following implementation of education strategies, a retrospective analysis was conducted to evaluate prescription fill rates and program utilization. Patient medical records of those discharged to home from the two selected inpatient units during a three-month period were reviewed. The first month of the period assessed reflects the pre-nursing education period, and the latter two months represent the post-nursing education period. Data was collected and incorporated into a data collection sheet to uniformly review each patient record. Pre- and post-nursing education surveys were also distributed to assess changes in baseline knowledge and utilization of the meds to beds program.
**Results:** The number and percentage of discharged patients from the two pilot units utilizing the meds to beds program will be recorded, and the results will be presented.

**Conclusions:** We hypothesize that providing education will lead to increased utilization of the meds to beds program assessed via prescription fill rates. Information obtained from this retrospective review will be applied to other inpatient units and initiatives to expand the utilization of the UMMMC meds to beds program within the institution.
Assessing the use of long-acting antipsychotic injections post-discharge before and after the first COVID-19 surge

Objectives: Long-acting antipsychotic injections (LAI) are recommended treatments for serious mental illnesses, such as schizophrenia, schizoaffective disorder, and bipolar disorder. In addition to being associated with prevention of relapse, reduced hospitalizations, and decreased symptoms, LAIs have unique pharmacokinetic profiles which improves adherence. However, rates of continuation of treatment in the outpatient setting and the impact the COVID-19 pandemic had on transitions of care are unknown. After the first COVID-19 surge, the outpatient process for administering LAIs at Cambridge Health Alliance's (CHA) was reconstructed and restricted to being offered by one provider at one clinic.

Methods: A retrospective chart review was conducted of adult patients who have received a LAI during an inpatient psychiatric admission at CHA between February 1, 2019 to February 28, 2020 and August 1, 2020 to August 31, 2021. The specific LAI administered inpatient, dose, diagnosis, if the LAI was court-mandated, and the administration of the first outpatient injection was collected. The primary outcome is the rate of administration of the first LAI due post-discharge. Patients' attendance of a follow-up appointment 7 days after discharge was collected to assess its potential association with administration of the next injection due.

Results: The pre-COVID-19 surge sample included 28 patients (mean age of 42, range 20-80) and the post-COVID-19 surge group included 53 patients (mean age of 40, range 19-71). Percentage of male patients was 75% in both groups. In the pre-COVID-19 surge sample, 62% of patients who received a LAI had a diagnosis of schizophrenia and 3.4% had a diagnosis of bipolar disorder vs 41% and 17% among the post-COVID-19 surge group, respectively. A total of 17 patients (61%) received their next LAI due post-discharge prior to the first COVID-19 surge versus 29 patients (55%) patients in the year following the first COVID-19 surge.

Conclusions: There was a lower rate of administration of LAIs due outpatient post-discharge among the post-COVID-19 surge group. In CHA's new process after the first COVID-19 surge, appointments were limited to one provider at one clinic. The restriction of available appointments at CHA appears to have decreased patient engagement and reduced adherence to outpatient LAI administrations.
Bang, Vivian

Evaluating the primary nonadherence rate on an integrated health system community pharmacy's transitions of care program

Conference Abstracts
May 16-18, 2022

Presenter Name: Bang, Vivian
Organization: St. Vincent's Outpatient Pharmacy, Bridgeport CT
Category: Transitions of Care
Day | Session | Room | Time: Poster

Authors: V. Bang, S. Gernant; St. Vincent's Outpatient Pharmacy, Bridgeport, Connecticut

Title: Evaluating the primary nonadherence rate on an integrated health system community pharmacy's transitions of care program

Objectives: This project aims to evaluate the primary nonadherence rate on new medications delivered to patients’ bedside in an integrated health-system's ToC pharmacy program. Primary nonadherence is defined as new medications that were electronically prescribed for patients to St. Vincent's Outpatient Pharmacy for a meds to beds service but was not obtained within two days of discharge from the hospital. All medications that were newly electronically prescribed, and dates of the new prescriptions that were dispensed to the patient or returned to stock (if applicable) will be evaluated. In addition, a new prescription is defined as being filled or dispensed for the first time for a patient at St. Vincent's Outpatient Pharmacy. Therefore, the goal is to assess what the primary nonadherence rate is at SVMC with the ToC program active between June 2018 and December 2021.

Methods: This research study will be conducted as a retrospective chart review. EnterpriseRx, Epic, and hardcopy records of the ToC program held within the SVMC Outpatient Pharmacy will be the sources of data extracted. Data collection will be done: (1) physically within the HHC/St. Vincent's Medical Center System or (2) remotely via the Hartford HealthCare VPN network by SVMC researchers and those named in partnership within the collaborating institution, University of Connecticut School of Pharmacy. Data collection will be done in Excel or on HHC-based REDCap (Research Electronic Data Capture), a HIPAA-compliant, password-protected, data collection platform.

Results: The preliminary results on the primary nonadherence rate on new medications delivered to patients’ bedside in the ToC pharmacy program may be presented during the conference.

Conclusions: The conclusion may be presented during the conference. It is anticipated that this project will demonstrate that the primary nonadherence rate through the ToC program will be favorable due to many factors.
Presenter Name: Bang, Vivian
Organization: St. Vincent's Medical Center; University of Connecticut School of Pharmacy
Category: Transitions of Care
Day | Session | Room | Time: Poster

Authors: Vivian N. Bang, PharmD; Gabriela Resto; Amber Buske; Hannah Ayers; Stephanie A. Gernant, PharmD, MS

Title: Evaluating the primary nonadherence rate on an integrated health system community pharmacy's transitions of care program

Objectives: This project aims to evaluate the primary nonadherence rate on new medications delivered to patients' bedside in an integrated health-system's ToC pharmacy program. Primary nonadherence is defined as new medications that were electronically prescribed for patients to St. Vincent's Outpatient Pharmacy for a meds to beds service but was not obtained within two days of discharge from the hospital. There will be no restrictions on the types of medications that will be included in the measure. All medications that were newly electronically prescribed, and dates of the new prescriptions that were dispensed to the patient or returned to stock (if applicable) will be evaluated. In addition, a new prescription is defined as being filled or dispensed for the first time for a patient at St. Vincent's Outpatient Pharmacy. The goal is to assess what the primary nonadherence rate is at SVMC with the ToC program active between June 2018 and December 2021, inclusive.

Methods: This research study will be conducted as a retrospective chart review. EnterpriseRx, Epic, and hardcopy records of the ToC program held within the SVMC Outpatient Pharmacy will be the sources of data extracted. Data collection will be done: (1) physically within the HHC/St. Vincent's Medical Center System or (2) remotely via the Hartford HealthCare VPN network by SVMC researchers and those named in partnership within the collaborating institution, University of Connecticut School of Pharmacy. Data collection will be done in Excel or on HHC-based REDCap (Research Electronic Data Capture), a HIPAA-compliant, password-protected, data collection platform.

Results: The preliminary results may be presented during the conference.

Conclusions: The conclusion may be presented during the conference.
Increasing pharmacist clinic referral following direct oral anticoagulant initiation in the hospital

Objectives: Direct-acting oral anticoagulants (DOACs) are increasingly being requested by patients and prescribed by providers for patients in need of anticoagulation due to decreased routine drug level monitoring, no requirement for consistency of vitamin K intake in one's diet, and fewer perceived interactions. Pharmacists within traditional warfarin-only anticoagulation management clinics are uniquely suited to review DOAC selection and dosing, provide patient education, and promote medication adherence for patients newly started on a DOAC. This quality improvement initiative was developed within the pharmacist-led anticoagulation management service (AMS) of a large, academic medical center whereby referral expansion aimed to increase the percentage of eligible new start DOAC patients referred to AMS pharmacists from a baseline of 2.30% from July to August 2021 to 25% of eligible new start DOAC patients referred from all hospital units (including emergency department) by May 1, 2022.

Methods: The goal of this quality improvement initiative was to expand the DOAC referral process for newly initiated inpatients in order to ensure appropriate DOAC selection and dosing, improve medication adherence, and provide patient education. Principles of the Institute of Healthcare Improvement's Model for Improvement guided this initiative and key stakeholders engaged pharmacy students, physicians, and clinical pharmacists to expand the referral process for eligible patients. While this quality improvement initiative targeted patients referred from inpatient services, the pharmacist-led AMS did accept referrals for patients transitioned to or newly started on a DOAC while outpatient. The outcome metric of interest was the percent of referrals placed to AMS of all new inpatient DOAC starts. Process metrics collected were number of DOAC referrals placed to AMS, number of new start DOAC patients across the hospital, and percent of DOAC referrals placed to AMS of eligible patients from inpatient stratified by floor/unit. Lastly, the balancing metric for this quality improvement initiative was the number of pages received by AMS pharmacists.

Results: Plan-Do-Study-Act (PDSA) cycles and subsequent data collection is still in progress. We anticipate four PDSA cycles in total that represent a step-wise approach to engagement in
the current referral process by pharmacy students, physicians, and clinical pharmacists. Interim analysis suggests that utilizing proactive approaches, as opposed to reactive approaches, to optimize expansion of the referral process has resulted in significantly increased referrals. We expect more comprehensive results by May 2022.

**Conclusions:** We anticipate that engagement with various care team members and expansion of referrals placed for patients newly started on a DOAC while inpatient to outpatient AMS will result in an increase in DOAC patients overseen by AMS and improved DOAC monitoring and management.
Presenter Name: Cuvellier, Molly  
Organization: Lowell General Hospital  
Category: Transitions of Care  
Day | Session | Room | Time: Wednesday | 6 | Wild Rose A | 3:30:00 PM

Authors: Molly Cuvellier, PharmD; Christina Johnson, PharmD, BCPS; Matthew Borden, PharmD, BCCCP

Title: Implementation of a standardized, pharmacist-driven, transitions of care training program, to improve pharmacist confidence in counseling patients at high risk of readmission.

Objectives: Thirty-day readmission rates are an area of concern for hospitals as they serve as a standard benchmark for the Centers for Medicare & Medicaid Services. In 2018, 3.8 million adults were readmitted to the hospital within 30 days of discharge, resulting in an average readmission rate of 14%. Decreased medication adherence has been associated with higher readmission rates; pharmacists possess the appropriate skill set to aid in patient education to help improve medication understanding and adherence. The goal of this project is to implement a standardized training program for pharmacists to increase confidence in providing discharge counseling for patients who are at high risk of readmission.

Methods: Pharmacists were selected for the training program based on assignments to direct patient care areas. Prior to initiating training, pharmacists completed a preliminary questionnaire, assessing their baseline confidence in providing effective patient education and discharge counseling. Pharmacists completed an educational module, followed by a written assessment and practicum. They were then observed performing discharge counseling with a patient. Following completion of the program, the pharmacists took a post training survey regarding the effectiveness of the training program, their confidence level after completion, and any barriers to their ability to provide effective discharge counseling. Eight pharmacists completed the initial survey, and the training program was piloted on two pharmacists. One pharmacist with no patient counseling experience or decentralized training, and a clinical oncology specialist whose role is primarily decentralized.

Results: The pre-training survey showed that 67% of pharmacists felt they could benefit from additional training in providing patient counseling; assessing patient understanding and communicating at an appropriate literacy level were reported as the most challenging parts of providing patient education. Interim results from the pilot showed an average score of 88% on the post-education assessment and 93% on the practicum portion of the training.

Conclusions: Based on interim results, we anticipate this quality improvement project will show that implementing a transitions of care training program provides pharmacists with tools to overcome common barriers and improve pharmacist confidence in providing patient education.
and effective discharge counseling. Implementation of the program with additional pharmacists and continued data collection will be necessary to demonstrate improvement in readmission rates and patient satisfaction.
Evaluating the quantity and associated impact of pharmacist-driven transitions of care interventions for heart failure patients within a community hospital

**Objectives:** Transitions of care (TOC), is a process by which patients are transitioned from one level or setting of care to another. The Joint Commission and other regulatory bodies recognize TOC as a vital component of patient care in order to ensure patient safety and improve clinical outcomes. These organizations have recognized that patients most vulnerable for a hospital re-visit due to ineffective TOC are patients living with chronic disease states such as diabetes mellitus, chronic obstructive pulmonary disease (COPD) and heart failure. The objective of this study is to evaluate the number of heart failure-specific interventions made by a pharmacist in a complete, three-phased TOC process (medication reconciliation, medication education, and post-discharge follow-up call) compared to that of an incomplete TOC process missing one or more phases.

**Methods:** This is a prospective study evaluating adult patients (≥ 18 years old) admitted to Suburban Hospital- Johns Hopkins Medicine with a clinical diagnosis of heart failure (reduced ejection fraction or preserved ejection fraction) who received TOC interventions by a pharmacist from August 2021 to April 2022. The patients included in the study will have a clinical diagnosis of heart failure. Patients being discharged to skilled nursing facilities or rehabilitation centers will be excluded. The primary outcome will evaluate the number of heart failure-specific interventions made by a pharmacist utilizing a complete TOC process compared to that of an incomplete TOC process. As a secondary outcome, the study will analyze the number of interventions made during each phase of the three-phased transitions of care process. A tertiary outcome will investigate the healthcare utilization of the study subjects within 30 days after discharge.

**Results:** Data collection is currently in progress until April 2022. Results for the primary, secondary and tertiary endpoints will be recorded and presented.

**Conclusions:** It is anticipated that this project will be used to advocate for TOC pharmacists and for potential implementation of a standardized TOC process for patients with high risk for inpatient re-admission.
Prevented Harm and Cost Avoidance Associated with a Pharmacist Discharge Medication Reconciliation Tool

Objectives: Transitions of care (TOC) is an area of healthcare prone to medication errors. Pharmacist involvement in TOC has been shown to reduce errors and costs. The pharmacy department at Penn Medicine Lancaster General Health (PMLGH) utilizes the Lancaster Pharmacist Discharge Assessment Tool (LP-DAT) to stratify patients for discharge medication reconciliation based on criteria such as number of medication changes, high risk medications, and readmission risk. The tool was internally validated to allow pharmacists to prioritize patients at greatest risk of a medication error occurring at discharge. Few previous studies have attempted to establish a relationship between prevented patient harm scored via the NCC MERP Medication Error Index and cost avoidance. The objective of this study is to determine the cost-avoidance of having a pharmacist complete targeted discharge medication reconciliation to prevent patient harm and costs associated with medication errors.

Methods: A retrospective chart review was conducted of patients at PMLGH for January 2021. Included patients had a pharmacist-initiated, physician-accepted discharge medication reconciliation intervention completed. Interventions were excluded if they were not accepted by the provider or if the interventions were to facilitate discharge. Data collection included patient demographics, the medication involved in the error, and the type of medication error. Each error was assigned an NCC MERP category by utilizing a rubric that was developed for this project. The probability of harm occurring was assigned based on the probability scores developed by Chen, et al. Cost assigned to the MERP category of the error was multiplied by the probability score assigned to the error to determine cost avoidance. The primary endpoint was the total cost prevention associated with discharge medication reconciliation utilizing LP-DAT tool. Secondary endpoints include net cost avoidance, cost avoided stratified by risk of medication, avoided NCC MERP harm, number of prevented medication errors, categorization of discrepancies, time spent on reconciliation, and individual cost avoidance per MERP category.

Results: The results of the primary and secondary endpoints will be recorded and presented.

Conclusions: It is anticipated that this project will demonstrate the value of having a pharmacist complete targeted discharge medication reconciliation.
Presenters Name: Hoffman, Abigail  
Organization: St. Elizabeth's Medical Center  
Category: Transitions of Care  
Day | Session | Room | Time: Wednesday | 6 | Wild Rose A | 4:30:00 PM

Authors: Abigail Hoffman, PharmD; Zi Fang, PharmD, PhD, BCPS, BCCCP

**Title:** Pharmacist-led implementation of insurance-driven ticagrelor prescribing in patients post-percutaneous coronary intervention (PCI)

**Objectives:** Percutaneous coronary intervention (PCI) is the most common cardiac invasive procedure to treat patients with coronary artery disease. American College of Cardiology (ACC)/American Heart Association (AHA) guidelines recommend the use of ticagrelor over clopidogrel in patients following PCI. Ticagrelor is available by brand name and not covered by many insurance companies resulting in expensive monthly costs leading to increased use of clopidogrel at our institution. Pharmacists are essential members of the interdisciplinary team and have the unique ability to help ensure patients have safe, effective, and affordable medication options.

**Methods:** This project involved implementing the role of pharmacists in verifying insurance coverage and patients' ability to afford ticagrelor upon discharge. The project aim was to achieve > 80% of patients being discharged on ticagrelor therapy following post-percutaneous coronary intervention by February 28th, 2022. The outcome measure assessed was the number of patients being discharged on ticagrelor weekly. Process measures included the number of patients being educated by the pharmacist on ticagrelor therapy post-PCI and the number of patients readmitted within 30 days for ischemic complications or thrombosis of the stent. Balancing measures included the average time spent by pharmacists calling the pharmacy, and the average time spent by pharmacists counseling the patient.

**Results:** All decentralized pharmacists rounding on the cardiology service were educated on this process and provided necessary materials by February 9th, 2022. The percentage of patients being discharged on ticagrelor per week ranged between 50% to 100% with a mean percentage of patients being discharged on ticagrelor of 79% weekly. In the final three weeks of the project period, 100% of patients screened were discharged on ticagrelor. A total of 6 patients (21%) had not been discharged on ticagrelor therapy throughout the entire project period, with cost identified as the primary factor. The average time spent by pharmacists contacting patients' preferred outpatient pharmacies was 13 minutes. Pharmacists spent an average of 16 minutes counseling patients to confirm their ability to afford medication therapy and understand the importance of taking the medication.
**Conclusions:** From the implementation of the project until February 28th, 2022, patients were discharged on ticagrelor post PCI 80% of the time. The patients who had not been discharged on ticagrelor had an average monthly cost of $412 and the financial burden was deemed to outweigh the benefit of ticagrelor therapy. Engaging pharmacists in the verification of insurance coverage and confirmation of patients' ability to afford their medications resulted in consistent screening of patients and discharge on ticagrelor when cost was not a barrier.
**Presenter Name:** James, Julia  
**Organization:** The Hospital of Central Connecticut  
**Category:** Transitions of Care  
**Day | Session | Room | Time:** Wednesday | 6 | Wild Rose A | 4:00:00 PM

**Authors:** J. James, K. Shepard, K. Sasiela, A. Levine

**Title:** Impact of a pharmacist-led transitions of care service on reducing readmissions among heart failure patients

**Objectives:** Acute heart failure admissions continue to strain the United States' healthcare system and impact patients' quality of life, despite the availability of guideline directed medical therapy (GDMT). The 2021 Update to the 2017 ACC Expert Consensus Decision Pathway for Optimization of Heart Failure Treatment recommend the use of pharmacy and nursing services to further optimize GDMT. Pharmacist-driven transitions of care (TOC) services have been shown to decrease readmission rates, however, most of these studies focused on outpatient pharmacy services. Due to the limited research describing pharmacists' involvement with TOC during hospital admission and the immediate post-discharge period the purpose of this study was to analyze the effect of an inpatient pharmacist-driven TOC program on 30-day readmissions among heart failure patients.

**Methods:** A retrospective, observational, pre-post study was conducted between January 19th, 2019 and December 31st, 2021 to review the impact of a pharmacist-driven TOC program that was implemented in January 2021. A chart review was performed to collect data on patients 18 years of age and older with a diagnosis of heart failure on their problem list to assess rates of 30-day readmission. The treatment group included patients who received pharmacist intervention including admission medication reconciliation, medication optimization, discharge medication reconciliation, medication counseling, and/or 72-hour follow-up phone call. The primary outcome of this study was to analyze the effects of a pharmacist-driven TOC program on 30-day readmission rates after index hospitalization and secondary outcomes included 30-day readmission to the emergency department or hospital and 30-day readmission due to heart failure-related causes.

**Results:** Rates of 30-day readmissions after index heart failure hospitalization along with secondary endpoints will be recorded and presented.

**Conclusions:** It is anticipated that this project will reveal a decrease in hospital readmissions after the implementation of a pharmacist-driven TOC program.
**Conference Abstracts**

**May 16-18, 2022**

**Presenter Name:** Kumari, Priyanka  
**Organization:** Northwell Health, Plainview Hospital  
**Category:** Transitions of Care  
**Day | Session | Room | Time:** Poster

**Authors:** Priyanka Kumari, PharmD; Jonathan Anson, PharmD, BCPS; Maryam Ahmed, PharmD, BCPS

**Title:** Assessing the effect of pharmacist discharge counseling and patient outreach on readmission rates of COPD and asthma patients

**Objectives:** Pulmonary diseases, including chronic obstructive pulmonary disease (COPD) and asthma, are common disease states for which patients are frequently readmitted to the hospital following discharge. Factors that may contribute to patient readmittance include inappropriate inhaler technique, lack of medication adherence, gaps in care, and absence of overall patient education on medication indications or side effects. The objective of this study is to identify the impact of pharmacist led medication counseling on 30-day readmission rates.

**Methods:** This was a single-center, retrospective and prospective cohort study assessing the impact that pharmacists can have in reducing hospital readmission rates amongst patients being discharged with medications for COPD or asthma. In both cohort groups, the main inclusion criteria included a diagnosis of COPD or asthma, and the patient must be discharged on at least 1 medication for these conditions. The control group included a review of discharge counseling notes from patient's charts from December 2019-February 2020 and patients were excluded if a pharmacist provided medication counseling. The comparison group included patients who were admitted to Plainview Hospital from December 2021-February 2022 and received pharmacist led medication counseling, followed by an outreach follow-up call after discharge.

**Results:** Current trend indicates that the number of patients that were readmitted within 30-days is significantly lower in the prospective group as compared to the retrospective group. The final results of this study are pending and will be reported at Eastern States Conference.

**Conclusions:** It is anticipated that in the intervention group, pharmacist led discharge counseling will improve patient's understanding of their medications while increasing patients' adherence and therefore, decrease 30-day readmission rates.
Conference Abstracts
May 16-18, 2022

**Presenter Name:** Letendre, Caroline  
**Organization:** Tufts Medical Center, Boston, MA  
**Category:** Transitions of Care  
**Day | Session | Room | Time:** Wednesday | 5 | Wild Rose B | 12:45:00 PM

**Authors:** C. Letendre, F. Massaro

**Title:** Frequency of therapeutic interchange for inpatients and the rate of discharge medication changes involving respiratory maintenance inhalers

**Objectives:** The benefits of an inpatient therapeutic interchange (TI) program are well-established. Unfortunately, the risks of a TI program are less well understood. The purpose of this study is to evaluate the clinical and operational impact of inpatient TI of respiratory maintenance inhalers.

**Methods:** This quality improvement project was completed via retrospective chart review of patients of all ages who were admitted to Tufts Medical Center (Tufts MC) on a respiratory maintenance inhaler between October 1, 2021 and February 28, 2022. Patients were identified using pharmacy drug charge records. Patients were excluded from the study if they were admitted directly to an ICU, transferred from an outside hospital, had a length-of-stay less than 24 hours, and/or expired while in the hospital. Patient-specific information including age, sex, and indication for respiratory maintenance inhaler were recorded. Data were analyzed to describe the frequency and type of inhaler interchange, the rate at which a substituted inhaler was prescribed at discharge, and the third-party payer coverage, and co-pay, for inhalers not changed back to the original inhaler at discharge.

**Results:** Of the 90 patients identified, 33 met inclusion criteria. There were 57 patients excluded from the study; 31 patients admitted to an ICU, 16 patients admitted to Tufts MC from an outside hospital, 6 patients bedded outpatient, and 4 patients expired. There was only 1 patient not changed back to their home respiratory maintenance inhaler at discharge. A more detailed description of patient demographics, inhaler use, and third-party payers will be described and presented.

**Conclusions:** This preliminary project helped inform future studies of the unintended negative consequences of a TI of respiratory maintenance inhalers in an academic medical center.
**Title:** Rate of hospital readmissions in patients with heart failure pre- and post-implementation of pharmacist-driven transitions of care interventions in a small community hospital

**Objectives:** Pharmacist-led transitions of care (TOC) interventions have demonstrated improved Heart failure (HF) outcomes and improved quality of life. Medication changes at discharge, poor adherence, and loss to follow-up contribute to increased hospital readmissions in patients with HF. South County Hospital currently lacks pharmacy discharge services for this patient population. The impact of patient-centered pharmacist-driven TOC interventions will be evaluated in patients with HF at South County Hospital.

**Methods:** After Institutional Review Board approval, a single center, quasi-experimental study assessing pharmacist-led TOC interventions in patients with HF will be conducted. Pharmacy TOC interventions including: admission medication reconciliation, patient-centered discharge counseling, and follow up phone calls will be implemented to address patient specific barriers toward self-care. All admitted patients with a primary diagnosis of HF will be included from July 1st through September 30th, 2021, prior to implementation of pharmacist-driven TOC interventions. After implementation, admitted HF patients from February 1st through May 1st, 2022, will be compared to those in the pre-intervention cohort. Data collected from the Electronic Medical Record will include patient age, sex, weight, height, heart failure medications at admission, number of co-morbid conditions, length of stay, medications at discharge, and number of admissions in the previous 6 months. The primary endpoint is 30-day readmission rate. Secondary endpoints include evaluation of patient experience scores pre- and post-interventions, and a patient satisfaction survey for those enrolled in the program.

**Results:** Pre- and post-intervention data will be collected, analyzed, and presented upon study completion.

**Conclusions:** It is anticipated this research will demonstrate a reduction in number of hospital readmissions in patients with heart failure at 30 days post-discharge, thereby supporting the importance of pharmacist-led TOC interventions in patients with HF.
Authors: Salma Metwally PharmD/MBA, Marc Sturgill PharmD, Michael Pedro PharmD, Camille Lachica, MA, BSN, RN-BC, CDP, Florence Chukwuneke, MSN, RN, AGPCNP-BC, CNRN, NVRN-BC

Title: Role of Onsite Community Pharmacy in Health Systems and Transitions of Care: Meds to Beds Initiative to Improve HCAHPS Scores and Reducing Hospital Readmission in Ischemic Stroke Patients

Objectives: This study aims to demonstrate the effect of utilizing bedside delivery services on the ischemic stroke population. Meds to Beds or Bedside Delivery Service is a pharmacist led initiative that processes and delivers discharge medications to patients in an in-patient setting before they are discharged home. Units throughout the hospital utilize bedside delivery services by sending prescriptions to be processed and delivered to the patient on the day of discharge. Bedside delivery services came to a halt for several units, including the stroke unit, during the Coronavirus pandemic.

Methods: This is a prospective study. The intervention group will be ischemic stroke patients discharged utilizing the Meds to Beds program. Pharmacist roles includes medication reconciliation, medication education as well resolving insurance issues and providing alternatives if needed. A 48-hour post-discharge follow up call is standard of the service. The call is aimed to assess patient's adherence to medication, understanding of their care plan as well mitigate any side effects the patient may have experienced. Patients enrolled are to receive pharmacist medication reconciliation and education prior to discharge as well as a 48-hour post discharge follow up call. The primary outcome will be the effect on HCAHPS score in three specific questions: â€œstaff told you what the medicine is forâ€, â€œstaff described possible side effectsâ€ and â€œunderstood the purpose of taking the medication.â€ The secondary outcome is the 30-day readmission rate of ischemic stroke patients before and after the intervention. The intervention group will be compared to a historical control group when no bedside delivery services were being utilized.

Results: Results are still pending as this study is still under IRB review. However, pharmacist involvement in discharge planning, transitions of care and patient follow up has been associated with positive patient perceptions as demonstrated by HCAHPS scores and improving patient outcomes as well reducing economic burden as demonstrated in associated reduced 30-day readmission rates.
**Conclusions:** Conclusions are still pending as this study is still under IRB review. Previous studies have shown that with patients leaving the hospital with discharge medications in hand, pharmacist-led patient education and individualized telephone follow up, pharmacists can play an active role in improving patient outcomes, reducing 30-day readmission rates, and improving HCAHPS score.
Impact of a multi-disciplinary care team on 30-day readmission and mortality rate in chronic obstructive pulmonary disease patients

Objectives: Chronic obstructive pulmonary disease (COPD) is one of the leading causes of hospital admission and death in the United States. The 2020 national average 30-day COPD readmission and mortality were 22.7% and 10.7% respectively. A collaborative multi-disciplinary care team was developed to reduce COPD-related readmission and mortality at Northern Light Eastern Maine Medical Center. This team provides COPD education to patients, addresses medication adherence barriers, and establishes follow-up care. This study evaluates the impact of this multi-disciplinary care team on 30-day readmission and mortality.

Methods: This is a retrospective, observational, cohort trial. Patients who are 18 years or older, admitted during the study periods, and diagnosed with ICD-10 codes of J44.9 or J44.1, for COPD with or without acute exacerbation respectively, were included. Patients were excluded if they were hospitalized for less than 24 hours, pregnant, had pneumonia, had active COVID-19 infection, or refused education in the intervention group. The study period for the intervention group was set from September 2021 to January 2022 when the multi-disciplinary care team is implemented. The control group was admitted from September 2019 to January 2020. The primary outcome is the composite endpoint of all-cause readmission and mortality rate. The secondary outcome is the composite endpoint of COPD-related readmission and mortality rate. Logistic regression is used to analyze primary and secondary endpoints.

Results: 328 patients were included in the analysis; 111 patients received care from the multi-disciplinary care team. 8 (7.2%) patients from the intervention group and 64 (29.5%) patients from the control group experienced the primary composite outcome of all-cause readmission and mortality. 0 (0%) patients from the intervention group and 16 (7.3%) patients from the control group experienced the secondary outcome of COPD-related readmission and mortality.

Conclusions: This study found a significant reduction in 30-day all-cause readmission and mortality in COPD patients with the implementation of a multi-disciplinary care team. This study supports the practice of multi-disciplinary care teams to provide COPD patient education, address medication adherence barriers, and establish follow-up care to reduce readmissions and mortality in patients with COPD.
Impact of pharmacy involvement in medication reconciliation on transitions of care

**Presenter Name:** Montoya, Chas  
**Organization:** Maimonides Medical Center  
**Category:** Transitions of Care  
**Day | Session | Room | Time:** Wednesday | 5 | Wild Rose B | 1:15:00 PM

**Authors:** A. Shumyatsky, C. Montoya

**Title:** Impact of pharmacy involvement in medication reconciliation on transitions of care

**Objectives:** There is extensive evidence supporting pharmacy involvement with medication reconciliation at both admission and discharge. In October 2021, Maimonides Medical Center implemented a new process for admission medication reconciliation. This process involved having pharmacists collect thorough medication histories on newly admitted patients and update the information within their electronic health record. This information was then communicated with the admitting team. The purpose of this study was to evaluate the impact of having pharmacists gather medication histories on newly admitted adult patients in the emergency department.

**Methods:** This was a single center, concurrent and retrospective study that included adult medicine patients admitted between October 5, 2021 and January 31, 2022 with a completed medication history. For the purpose of this study, chart reviews were done for patients who had a medication history completed after an admitting team's order reconciliation. The charts were reviewed to determine the number of interventions made by a pharmacist (medications added or removed) and the frequency of discrepancies (wrong dose, wrong formulation, wrong directions, etc.).

**Results:** Out of 150 patients included in the study, 50 patients had medication histories completed after the admitting team's order reconciliation was done. In total, pharmacists addressed 37 discrepancies among these medication histories including 13 (26%) with wrong medications reconciled, 26 (52%) with missing medications, and 11 (22%) resulting in inappropriate admission orders. The 150 patients had no difference in readmission rates when compared to patients who did not have a medication history done by a pharmacist.

**Conclusions:** Pharmacists can improve transitions of care and patient outcomes by playing an active role with medication reconciliation. Outcomes are improved by addressing discrepancies among both home medications and admission orders. The next steps of the project include expansion of the program to involve pharmacist review of discharge order reconciliation within the medical center. Further review of results with a larger sample size will assist with evaluating the impact on re-admission rates among patients with pharmacy-led medication histories.
**Conference Abstracts**  
May 16-18, 2022

**Presenter Name:** Montross, MeiLing  
**Organization:** Geisinger, State College, Pennsylvania  
**Category:** Transitions of Care  
**Day | Session | Room | Time:** Tuesday | 4 | Wild Rose B | 4:15:00 PM

**Authors:** M. Montross, L. Learn, B. Gruver, S. Dombrowski, C. Hanna, S. Douthit

**Title:** Impact of interdisciplinary case management and pharmacist transitions of care interventions on high risk 30-day readmissions

**Objectives:** Pharmacists and case managers positively impact patient health outcomes and costs during the transition of care from the hospital to the home. However, the combination of both specialties completing post-discharge telephone calls has not been clearly studied. The purpose of this research is to identify the combined impact of pharmacists and case managers on the transitions of care process on 30-day hospital readmissions when compared to a post-discharge telephone call from either group alone.

**Methods:** Patients included in this retrospective study were those discharged from Geisinger hospitals from January 1, 2021 to September 1, 2021 and were eligible for a post-discharge telephone call from both pharmacy and case management services due to high risk for readmission. The primary outcome was the incidence of 30-day all cause readmissions in both groups. Secondary outcomes included 30-day emergency department visits, reasons a pharmacist call was not completed, and types and number of medication therapy problems identified by pharmacists during the call. Results were analyzed using descriptive and chi square analyses.

**Results:** Eighty-five hospital discharges and 84 patients were included in the study, with 25 patients receiving a post-discharge telephone call from both case management and pharmacy, and 59 patients receiving a call from either group alone. 30-day all cause readmissions occurred in 12% of the combined group versus 27% from either group alone (p=0.139). 30-day all cause emergency department visits were 8% in the combined group versus 12% in either group alone (p=0.617). A pharmacist call was not completed on 47 discharges due to no answer by the patient after three attempts (51%), patient refusal of the call due to already having discussed medications with someone else (34%), and patient refusal of the call with no reason given (13%). Of the 38 post-discharge encounters completed by pharmacists, 120 medication therapy problems were identified, averaging over 3 medication issues per patient.

**Conclusions:** Collaboration amongst pharmacists and case managers has the potential to positively impact patient outcomes upon discharge from the hospital. While the 30-day readmission results from this study were not statistically significant likely due to limited sample size, the data does trend toward favoring combined interventions between the two healthcare
specialties. The combination of a pharmacist and a case manager to the transitions of care process resulted in identification of medication therapy problems that may have otherwise negatively impacted patient health and caused greater financial burden on the healthcare system.
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May 16-18, 2022

**Presenter Name:** Novinger, Alexandra  
**Organization:** Temple University Hospital  
**Category:** Transitions of Care  
**Day | Session | Room | Time:** Wednesday | 5 | Wild Rose B | 1:00:00 PM

**Authors:** Alexandra Novinger, PharmD; Adam Diamond, PharmD, BCPS; Sheriff Gbadamosi, PharmD, BCCCP; Caitlyn LaBella, MD; Jaime Robenolt Gray, PharmD, BCCCP, FCCM

**Title:** Impact of prospective pharmacist review during intensive care unit to floor transfer

**Objectives:** Transitions from the intensive care unit (ICU) to the floor have long been associated with adverse events. Safe use of medications, including medication reconciliation across the continuum of care, is one of the National Patient Safety Goals put forth by the Joint Commission. Recent studies have shown that almost half of ICU to floor transfers resulted in at least one medication related error. To our knowledge, prospective pharmacist review within 24 hours of ICU to floor transfer has not been evaluated as an intervention to decrease the risk of medication related errors on transfer. We hypothesized that at least two medication related problems of Grade D or higher (as determined by Overhage and Lukes Scale) would be identified per patient. The primary objective of this study was to evaluate the impact of prospective pharmacist review during ICU to floor transfer.

**Methods:** This was the first phase of a two-phase prospective pilot study being conducted at Temple University Hospital â€” Main Campus. The first phase was a prospective 12-week medication profile review within 24h of ICU to floor transfer. Phase two of the study will be a retrospective analysis evaluating ICU readmission. Patients being transferred between 12/11/2021 and 03/04/2022 were included if they met the following criteria: age > 18 years of age, ICU length of stay > 48 hours, and transfer from an ICU to a medical/surgical ward. Patients were excluded if they were transferred after 10am on Friday through Sunday at noon. The primary endpoint was the severity and number of errors identified by pharmacist interventions within 24h of ICU to floor transfer. Secondary endpoints included: cost avoidance, medication classes associated with errors, and ICU readmission within 7 days of transfer. Severity of errors were classified by the Overhage and Lukes scale. Descriptive statistics will be used to analyze the data.

**Results:** Severity of errors will be assessed for each pharmacist intervention that is made. The number of errors in each severity category as well as the number of errors that included a high risk medication will be documented. For the secondary endpoint, the cost avoidance, time spent, ICU readmission, and number of errors per medication class will be assessed.

**Conclusions:** It is anticipated that this study will help to establish the necessity of pharmacist review upon patient transfer, as well as identify the most common errors and their severity that
occur during transfer. Future directions include evaluating the appropriateness of hospital discharge medications.
Conference Abstracts  
May 16-18, 2022

Presenter Name: Olbert, Brittany  
Organization: Greater Baltimore Medical Center  
Category: Transitions of Care  
Day | Session | Room | Time: Wednesday | 6 | Wild Rose A | 3:45:00 PM

Authors: B. Olbert, N. Tran, S. Arnold; Greater Baltimore Medical Center (GBMC), Towson, Maryland

Title: Implementation of a pharmacy resident-lead transitions of care (TOC) program in a community teaching hospital

Objectives: The primary research objective is to determine if a pharmacy-led TOC program would reduce 30-day all cause hospital readmission rate and lead to better patient satisfaction at Greater Baltimore Medical Center (GBMC). Our secondary objective includes number of medication interventions made and total patient medication cost savings.

Methods: A single-centered, prospective, randomized, study conducted for four months. Patients will be randomized using a random number generator to either TOC intervention group or control group. The study inclusion criteria are patients greater than 18 years with one or more of the following: high risk disease states (acute myocardial infarction, diabetes, renal disease, heart failure, chronic obstructive pulmonary disease, and pneumonia), being discharged on more than 5 chronic medications, or on at least one high risk medication (insulin, anticoagulants, or antibiotics). Patients with altered mental status, on palliative care, or being discharged to long-term care are excluded from the study. The primary outcome of this study is 30-day all cause hospital readmission rate which will be calculated using a chi-squared test. Secondary outcomes of this study, measured within the intervention group, will include patient satisfaction score, baseline characteristics, total number of prescription medications at time of admission, risk of readmission, number of high-risk medications and interventions made. Descriptive statistics and regression models will be analyzed using IBM SPSS Software.

Results: Total number of 30-day readmission rates and baseline characteristics for the intervention group and control group will be collected. Data will be used to determine if the pharmacy-led TOC program lead to a decrease in hospital readmission rates. For the intervention group the average patient satisfaction score for each question will be reported, based off of a 5 point Likert scale. Number of medication interventions and types of intervention, including medication omissions, dose adjustments, duplicate medication therapy, medication interactions, medication cost savings and new start anticoagulation packet education will be collected and presented.
Conclusions: It is anticipated that this project will show the impact of pharmacists, particularly pharmacy residents, on 30-day readmission rates, medication cost savings, and patient satisfaction with the TOC program.
**Presenter Name:** Puleo, Charles  
**Organization:** Martinsburg VAMC  
**Category:** Transitions of Care  
**Day | Session | Room | Time:** Wednesday | 6 | Wild Rose A | 3:15:00 PM

**Authors:** C. Puleo, A. Lizer; Veteran Affairs Medical Centers (VAMC), Martinsburg, WV

**Title:** 30-day chronic obstructive pulmonary disease (COPD) readmissions through implementation of the comprehensive transitions of care program COPD Coordinated Access to Reduce Exacerbation (CARE).

**Objectives:** The purpose of this study is to analyze the impact of the chronic obstructive pulmonary disease (COPD) Coordinated Access to Reduce Exacerbation (CARE) program on 30-day hospital readmission rates for COPD. With a national readmission rate of 22.6% and a further 3-fold increased prevalence of COPD among Veterans, this population is at a heightened risk for readmissions. To address this issue, the Global Initiative for Chronic Obstructive Lung Disease guidelines recommended increased efforts in addressing modifiable risk factors for readmission, including time to follow-up, patient discharge education, and development of action plans.

**Methods:** This study is a single-center, retrospective chart review of patients discharged from the hospital pre/post implementation of the COPD CARE program who met the following inclusion criteria: discharged from the hospital with a primary diagnosis of COPD and received follow-up/primary care services from the VA main campus or one of the remote clinics. The study will be conducted at the Martinsburg VA Medical Center, with the pre-implementation data collection occurring from June 1, 2020 to May 31, 2021 and the post-implementation data collection occurring from June 1, 2021 to March 31, 2022. The primary outcome is COPD-related hospital readmissions within 30 days after discharge, and the secondary outcomes include time to first readmission, documented components of COPD CARE, vaccinations received, inhaled corticosteroid use, and pulmonologist follow-up.

**Results:** The number of patients who are readmitted for COPD exacerbations, along with all secondary endpoints, will be recorded and presented.

**Conclusions:** The project is expected to produce results that demonstrate the role of the comprehensive, multidisciplinary transitions of care program COPD CARE and its reduction on COPD-related hospital readmission rates.
Assessment of the quality of discharge medication reconciliation for patients in a cardiac-focused unit after implementation of a pharmacist-led discharge medication review process

**Objectives:** Changes made during hospitalization can lead to unintentional errors in discharge medication reconciliation. Studies have shown that 70.7% of patients experience at least one medication discrepancy upon discharge and the median number of discrepancies decreased by 54% after pharmacist involvement. Cardiac patients often have several new medications or dosage adjustments and are commonly prescribed high-risk therapy, such as anticoagulants or antiarrhythmics. The purpose of this study was to assess discrepancies identified and resolved in patients on a cardiac-focused unit when a pharmacist reviewed discharge medication reconciliation compared to current hospital practice.

**Methods:** This study was a single-center, prospective study performed at a 359-bed community teaching hospital. The intervention arm included patients discharged from the cardiac-focused unit between October 5 and December 31, 2021 for whom a pharmacist reviewed discharge medication reconciliation. The retrospective control arm included patients discharged from the cardiac-focused unit between September 1 and September 30, 2021 for whom current hospital discharge practices were followed. Discrepancies were identified if discharge medication orders met any of the following criteria: duplicate therapy, indicated medication not ordered, improper drug selection, improper dose, medication not indicated, significant drug-drug interactions with concomitant medications, therapeutic substitution for hospital formulary not switched back, cost issues, or transitions of care concerns. The primary outcome was the number of medication discrepancies identified and resolved in the intervention arm versus the control arm.

**Results:** There were 47 discrepancies identified in the intervention arm, 40 (83%) of which were resolved, compared to 43 discrepancies identified in the control arm, none of which were resolved. 38% of patients in the intervention arm and 42% of patients in the control arm had at least 1 discrepancy. These are preliminary findings. Final results will be presented.

**Conclusions:** It is anticipated that this study will show that pharmacist review of discharge medications may result in identification and resolution of discrepancies that may then be resolved prior to leaving the hospital. It is assumed that this may improve patient outcomes and lead to the addition of a pharmacist position in the transitions of care role.
Assessing knowledge and attitudes of nursing staff regarding congestive heart failure medication regimens and impact on patient understanding post-discharge

Objectives: A previous study conducted at the institution in 2018 found that 68% of patients who were readmitted did not understand their disease state, and 52% of patients or their caregivers did not understand the medications they were prescribed. Patients diagnosed with congestive heart failure (CHF) are taking several complex medications, without fully understanding how these medications can improve their disease state and prevent hospitalization. Currently, in the inpatient setting, nursing staff are responsible for educating patients about new medications with first administration and at discharge. This study aimed to identify gaps in medication education delivery and patient understanding that may be addressed by re-designing an interdisciplinary service. Primarily, the study aimed to describe knowledge of nurses and patients about their CHF medication regimen. Secondarily, the study aimed to describe differences in attitudes and perceptions between nurses and patients regarding the adequacy or extent of medication education provided, and to measure factors that may be driving incomplete patient understanding.

Methods: Nursing staff and patients included were ages 18 or older. Nurses included were limited to medical surgical nurses at Guthrie Robert Packer Hospital- Sayre Campus. Nursing staff were anonymously surveyed about congestive heart failure medications and attitudes towards medication education. Patients were admitted at Guthrie Robert Packer Hospital-Sayre Campus with a concurrent CHF diagnosis, communicated in English, and had no cognitive disability (Alzheimer's Disease, etc) unless a caregiver is present. Patients admitted with a diagnosis of congestive heart failure were peri-prospectively identified via an electronic report for a 3-month period. Patients and/or caregivers were contacted post-discharge for a knowledge and attitudes assessment.

Results: Sixteen nursing survey responses were included, resulting in a nursing survey response rate of 7.66% (16/209). Ninety-six patients were reviewed for inclusion, of which 33 were eligible for patient survey and a patient survey response rate of 30.3% (10/33). The exact results will be recorded and presented.
Conclusions: This study identified several gaps in medication education delivery including the inability to identify common side effects, mechanisms of medication in heart failure, and provide complete medication education. These gaps may be addressed with nursing education and interdisciplinary pharmacy presence during discharge to aid in transitions of care.
Presenter Name: Wagner, Caroline  
Organization: Tufts Medical Center, Boston MA  
Category: Transitions of Care  
Day | Session | Room | Time: Tuesday | 4 | Wild Rose B | 4:00:00 PM

Authors: C.Wagner, A.Dutton  
Title: Evaluation of a pharmacy post-discharge medication management service in nephrology clinic  
Objectives: The aim of this project is to design, implement, and evaluate a Pharmacist Post-Discharge Medication Management Service for patients discharged from Tufts Medical Center (TMC) with follow-up visits in nephrology clinic. The goal of the service is to ensure the medication list for a patient is accurate and appropriate and address medication access and adherence issues. The impact of the service will be defined by the number of medication reconciliation discrepancies identified and the number and type of subsequent pharmacist interventions, as well as which groups of patients had the greatest benefit from this service.  
Methods: Patients discharged from TMC with nephrology clinic follow up appointments who received the service from September 1, 2021 through February 28th, 2022 were included. Patients on dialysis, within one year of kidney transplant, or discharged to a skilled nursing facility were excluded, as TOC services already exist for these populations. The service included a chart review, telephonic comprehensive medication review with the patient including predetermined adherence questions, and subsequent interventions to resolve discrepancies prior to clinic follow up. Identified discrepancies and intervention number and type were analyzed using descriptive statistics and categorized according to classification of kidney disease (kidney transplant vs. non-transplant) and type of patient visit (new patient vs. established nephrology patient).  
Results: Twenty-three patients received this service during the specified time frame, with intervention and documentation taking approximately 35 minutes per patient. On average, two medication reconciliation discrepancies were identified per patient, and the pharmacist performed two discrepancy-related interventions per patient, including patient education and provider consultation interventions. Patients who had a history of kidney transplant had more discrepancies on medication reconciliation and a greater number of pharmacist interventions. Patients newly referred to nephrology clinic had fewer chronic medications but were more likely to need or request adherence support by the pharmacist.  
Conclusions: This project demonstrated the successful implementation of a TOC service within the TMC nephrology clinic and the value of the pharmacist providing the service. These results can be utilized to create targeted TOC services for different patient populations with outpatient.
nephrology clinic follow-up, with potential emphasis on patients with history of kidney transplant due to complexity of medication changes and newly referred patients due to need for adherence support.
Authors: N. Zafar, PharmD, H. Farooque, PharmD, J. Jose, PharmD

Title: Evaluation of pharmacy involvement in medication reconciliation discrepancies

Objectives: Medication reconciliation is defined by the Joint Commission as the process of comparing the medications a patient is taking with newly ordered medications with the intent to resolve discrepancies or prevent potential medication errors. The accuracy of medication reconciliations allows healthcare professionals to have a better understanding of a patient's past and present health conditions. Identifying and resolving medication discrepancies plays a significant role in ensuring patient safety and providing optimal patient care. The objective of this study was to understand the impact of pharmacy involvement in the medication reconciliation process when compared to non-pharmacy involvement such as attendings, medical residents, and nurses.

Methods: This was a single-center, prospective cohort study that assessed the impact of pharmacy involvement compared to non-pharmacy involvement in identifying medication reconciliation discrepancies in a community teaching hospital. Fifty patients were enrolled in each arm during the study period of January 2022-March 2022. For both arms, a random number generator selected two to four patients with a completed medication reconciliation in the outpatient medication review each day. The medications listed in the outpatient record were then compared to inpatient orders to identify any discrepancies. The primary endpoint was the number of discrepancies identified by pharmacy involvement compared to non-pharmacy involvement. The discrepancies collected from these records were categorized into drug class, drug name, drug strength, directions, frequency, duplications of therapy, and medications not ordered.

Results: Pharmacy's involvement in the medication reconciliation process resulted in a decreased number of discrepancies when compared to non-pharmacy's involvement [0% vs 48% respectively.] The medication reconciliation process further identified that 26% of discrepancies in the non-pharmacy involvement arm were related to a medication that was not ordered, 16% of discrepancies were related to drug frequency, 14% of discrepancies were related to drug directions, 10% of discrepancies were related to drug class, 8% of discrepancies were related to drug strength, and 2% of discrepancies were related to duplication of therapy. In all instances, providers were contacted by a pharmacist and the discrepancies were resolved.
Conclusions: The medication reconciliation process can easily lead to suboptimal care when medications are not accurately updated upon each visit to a healthcare setting. However, with pharmacy’s expertise, their impact in the medication reconciliation process has shown to lower the rate of discrepancies in a patient's transition process, prevent potential medication errors, and improve patient safety.
Assessment of induction antithymocyte globulin dose reduction on outcomes of de novo belatacept immunosuppression in kidney transplant recipients at risk for delayed graft function

Objectives: Ideal dosing strategies for induction therapy have yet to be determined in the setting of de novo belatacept use. Previously, our center observed acceptable patient and graft survival using a de novo belatacept (DNB) protocol in patients at high risk for delayed graft function (DGF) in the setting of lymphocyte depleting induction therapy with antithymocyte globulin (ATG). However, cytomegalovirus (CMV) and BK viremia rates were higher than anticipated. This study will investigate the effects of an ATG induction dose reduction strategy on patient outcomes in the setting of DNB maintenance.

Methods: This retrospective study reviewed medical charts of patients who were Epstein Barr Virus seropositive adults (> 18 years of age), received their first kidney transplant from a deceased donor and were treated with the DNB protocol from December 1, 2018 to December 31, 2020. DNB protocol is defined as patients receiving belatacept within 7 days of transplant after ATG induction therapy. Following the results of the previous study, the ATG dose was changed from 1.5 mg/kg for four doses (total 6 mg/kg) to 1.5 mg/kg for 3 doses (total 4.5 mg/kg) in an effort to reduce CMV and BK viremia rates. This study will evaluate the impact of this dose reduction strategy. The primary outcome will be the incidence of CMV and BK viremia. Secondary endpoints will include patient and graft survival, the incidence of acute rejections, and kidney function (assessed using estimated glomerular filtration rate).

Results: The incidence of CMV and BK viremia, patient and graft survival, incidence of acute rejections, and kidney function will be presented.

Conclusions: Results of this study will contribute to the growing knowledge surrounding DNB use and the optimal induction therapy to be utilized in kidney transplant recipients at high risk for delayed graft function. This study will further guide appropriate protocol use and changes at our institution.
Conference Abstracts  
May 16-18, 2022

**Presenter Name:** Bender, Michele  
**Organization:** Hackensack University Medical Center  
**Category:** Transplant  
**Day | Session | Room | Time:** Wednesday | 6 | Magnolia D | 4:00:00 PM

**Authors:** M. Bender, M. Wynd, A. Patel, D. Serur, V. Ahmed, M. Goldstein; Hackensack University Medical Center, Hackensack, NJ

**Title:** Immunosuppression protocol change from immediate release to extended release tacrolimus in kidney transplant recipients: impact on patient and provider

**Objectives:** Prior to 2020, de novo kidney transplant recipients receiving tacrolimus at Hackensack University Medical Center (HUMC) were initiated on the immediate release formulation. In January 2020, the extended release tablet became the preferred formulation of tacrolimus at HUMC. This study aims to identify the optimal tacrolimus exposure to maximize drug efficacy and minimize drug adverse effects; and determine if extended release tacrolimus (Envarsus XR®) provides a practical advantage over immediate release tacrolimus.

**Methods:** This is an IRB-approved, retrospective chart review of adult patients who received a kidney-alone transplant in 2019 or 2020, and were initiated on maintenance therapy with mycophenolic acid and tacrolimus. Patients were excluded if they had a previous transplant, were on immunosuppression at baseline, or received prednisone as part of their maintenance therapy. Baseline characteristics, adverse effects, dose adjustments, trough concentrations, opportunistic infections (such as cytomegalovirus or BK virus), and socioeconomic barriers were collected up to one year post-transplant. The primary endpoint is target trough concentration attainment between the different tacrolimus formulations. Secondary endpoints include glycemic control, biopsy proven acute rejection, infections, and patient and graft survival at one year post-transplant.

**Results:** Out of the 152 patients who received tacrolimus post-transplant, 89 patients were included in the study (37 received immediate release tacrolimus and 52 received extended release tacrolimus). Preliminary results indicate a higher daily pill burden for patients taking immediate release tacrolimus (mean of 8.12 capsules per day) compared to extended release tacrolimus (mean of 3.11 tablets per day). Additionally, more opportunistic infections were identified in patients receiving extended release tacrolimus (30.7% vs 16% (NSS)) while more patients receiving immediate release tacrolimus had an episode of hyperkalemia requiring pharmacologic intervention (29% vs 17% (NSS)). Final results on trough attainment, adverse events, and patient outcomes will be reported.

**Conclusions:** Results of this study will help guide the selection of tacrolimus oral formulations in adult de novo kidney transplant recipients receiving tacrolimus.
Presenter Name: Callaghan, Katelyn
Organization: Hospital of the University of Pennsylvania
Category: Transplant
Day | Session | Room | Time: Tuesday | 4 | Magnolia C | 3:00:00 PM

Hospital of the University of Pennsylvania, Philadelphia, PA

Title: Safety of Stimulant Use in Heart Transplant Recipients

Objectives: FDA-approved prescribed stimulants are purported to increase risk of cardiovascular (CV) adverse events, particularly arrhythmias and sudden cardiac death. Debate exists regarding the safety of stimulants in the CV population, with even more uncertainty in heart transplant (HT) recipients. This study aims to characterize the safety of stimulant use following HT.

Methods: This single center retrospective cohort study included adult HT recipients transplanted from January 1st 1990 to March 1st 2021 with post-HT exposure to stimulant therapy in either the inpatient or outpatient setting. Patients were excluded if expired prior to discharge from index admission, HIV seropositive, or multi-organ transplant. Exposure was defined as having been prescribed a stimulant medication, either amphetamine or non-amphetamine. Exposed patients were matched to a comparator control group of HT recipients with no stimulant use history, according to age, sex, transplant indication, and date of transplant. The primary outcome was incidences of arrhythmia and major adverse cardiovascular events (MACE). Secondary outcomes included incidences of rejection, both acute cellular and antibody mediated, and graft loss. Outcomes were assessed for at least 6 months following stimulant initiation and compared across exposed and control groups. Data was analyzed by Fisher’s exact test with a two-sided p value of less than 0.05 considered significant.

Results: Twenty-five stimulant-exposed and twenty-five matched control HT recipients were included for analysis, with a majority of white, male patients (62%). HT indications included non-ischemic cardiomyopathy (60%), ischemic cardiomyopathy (30%), and other (10%). A minority of patients across both groups had diagnoses of attention disorders (16%), with the majority diagnosed with other mood disorders (68%). Within the exposed group, the mean age (SD) at stimulant initiation post-HT was 52.6 years (Â±13.2), and the mean time (SD) from HT to stimulant exposure was 4.7 years (Â±4.6). Following HT, 92% received an amphetamine-based agent, while 12% received a non-amphetamine based. No significant differences were observed for incidences of arrhythmia, MACE, or graft loss. Overall incidence of rejection was significantly higher in the control group as compared to the exposed (64% versus 20%, p<0.01).
**Conclusions:** Prescribed stimulant use in HT recipients was not associated with increased risk of arrhythmia, MACE, or graft loss when compared to non-stimulant exposed. Notably, stimulant use was associated with a lower incidence of rejection, though this is likely a result of selection bias within the exposed group. Given numerous confounders and small sample size, further investigation is warranted to determine safety of stimulant use in HT recipients.
Chen, Rita

**Effects of immunosuppression titration by single point immune cell function assay in heart transplant patients**

**Presenter Name:** Chen, Rita  
**Organization:** MedStar Washington Hospital Center (MWHC)  
**Category:** Transplant  
**Day | Session | Room | Time:** Tuesday | 4 | Magnolia C | 3:30:00 PM

**Authors:** Rita Chen, Bolanle Lawuyi

**Title:** Effects of immunosuppression titration by single point immune cell function assay in heart transplant patients

**Objectives:** Heart transplant patients are at increased risk of rejection and infection. The ImmuKnow assay, an immune cell function assay, is used as an additional means of monitoring cell-mediated immunity in solid organ transplant patients. The long-term effects of the use of an immune cell function assay to guide immunosuppression titration in heart transplant patients remain elusive. The objective of this study is to evaluate effects of immunosuppression titration guided by single point immune cell function assay results in heart transplant patients.

**Methods:** Electronic medical records of patients who received heart transplantation at MWHC between January 1, 2013 and June 30, 2020 were reviewed. Patients were excluded if they had a history of previous transplantation, multi-organ transplantation, active infection or rejection at 1-year post transplant, or death within 1-year post transplant. Each patient's medical record was evaluated for incidence of rejection or infection within 3- and 6-months of the 1-year post transplant clinic visit. The incidence of rejection or infection was compared between patients whose immunosuppression medications were titrated based on the result of the immune cell function assay to those who did not have the assay conducted at the 1-year clinic visit. Information assessed included: demographics, infectious serologies, induction therapy, maintenance immunosuppression regimen at 1-year post transplant, the result of the immune cell function assay, and the immunosuppression titration strategy employed based on the result.

**Results:** The incidence of rejection and infection within 3- and 6-months of the 1-year post-transplant clinic visit will be recorded and results will be presented.

**Conclusions:** It is anticipated that this project will demonstrate the role of immune cell function assay in guiding immunosuppression titration in heart transplant patients.
Assessment of intrapatient variability of tacrolimus and the impact on estimated glomerular filtration rate in solid organ transplant recipients

Objectives: Tacrolimus is commonly utilized in patients post-transplant due to its proven ability to improve graft survival and prevent acute rejection episodes. Despite its clinical utility, tacrolimus is associated with nephrotoxicity due to afferent arteriolar vasoconstriction resulting in negative effects on estimated glomerular filtration rates (eGFR). High intrapatient variability (IPV) of tacrolimus levels has been associated with worsening graft outcomes in patients, but the effects of IPV on eGFR is not well studied and warrants research. The objective of this study is to evaluate the effects of IPV on eGFR in patients who received a solid organ transplant (SOT).

Methods: This single center, retrospective chart review evaluated patients who received a kidney, liver, heart or lung transplant at TUH from 01/01/2014-08/31/2019. An IPV was calculated for each patient based on their tacrolimus levels and categorized into either high IPV cohort (IPV>20%) or low IPV cohort (IPV<20%) to assess differences in renal outcomes. The study included patients 18 years or older with at least three documented outpatient tacrolimus levels at months 6-12 and eGFR at months 6, 12, 18 & 24 post-transplant. Patients were excluded if they were switched from tacrolimus, drug administration other than oral, received a multi-organ transplant, received hemodialysis 6 months post-transplant, passed away within two years or lost to follow up. The primary and secondary endpoints assessed change from baseline in eGFR, serum creatinine and proteinuria at 12, 18 & 24 months post-transplant. Data collection included patient demographics, characteristics and variables to assess renal function. To analyze the data, a Chi Squared or Fisher's exact test was used for categorical data and a Student T-test or Mann-Whitney U test was used for parametric and non-parametric continuous data.

Results: IPV of tacrolimus levels between 6-12 months and eGFR at months 6, 12, 18 and 24 months post-transplant will be compared between both groups. Incidence of worsening renal function and baseline patient characteristics between both groups will be analyzed and results will be presented.
Conclusions: It is anticipated that the results of this project will provide the transplant community more information regarding the clinical utility of IPV of tacrolimus and its impact on renal function to potentially ignite research to optimize IPV in the future.
Conferences Abstracts  
May 16-18, 2022

Presenter Name: Huang, Xinyi  
Organization: The Johns Hopkins Hospital  
Category: Transplant  
Day | Session | Room | Time: Tuesday | 3 | Empire C | 1:30:00 PM

Authors: Xena Huang, Kari Allan, Kay Hapgood, Cozumel Pruette, Elizabeth Goswami

Title: LCP-tacrolimus dosing in pediatric and young adult transplant recipients

Objectives: There are limited published data on dosing LCP-tacrolimus (LCP-tac) in the pediatric population. This study analyzes LCP-tac dosing in pediatric and young adult transplant recipients and describes doses needed to reach therapeutic ranges, both for de novo dosing and conversion from immediate-release tacrolimus (IR-tac).

Methods: This is a single-center, retrospective, observational study of LCP-tac use in pediatric and young adult kidney and liver transplant recipients cared for by the pediatric transplant teams. Inpatients and outpatients initiated on LCP-tac de novo post-transplant or converted from IR-tac between January 1, 2018, and September 30, 2021, were included. To characterize LCP-tac dosing strategies, we evaluated patients' initial LCP-tac dose (mg/kg) and conversion ratios of IR to LCP-tac initially; we assessed the LCP-tac dose that first resulted in an in-goal level, conversion ratios at goal, and the number of dose adjustments needed to reach goal trough. Adverse events related to LCP-tac and graft-related outcomes up to 12 months after LCP-tac initiation will also be assessed.

Results: 41 patients were included, 73% (n=30) were kidney recipients, and 27% (n=11) were liver recipients; 15% (n=6) were initiated de novo, and 85% (n=35) were converted from IR-tac. Patients were initiated at median dose of LCP-tac of 0.034 mg/kg (IQR=0.019) when started de novo vs 0.091 mg/kg (IQR=0.07) when converted. The first in-range tacrolimus trough level was achieved by a median of 7.5 days (IQR=15) in de novo group, by 5 days (IQR=24) if formulation conversion occurred inpatient, and by 22 days (IQR=41.5) if conversion occurred outpatient.

Conclusions: This project supports the feasibility of de novo LCP-tac use in pediatric and young adult transplant recipients. Empiric de novo LCP-tac dosing was more conservative than IR-tac converted upon initiation, however, patients from both groups reached therapeutic trough within numerically similar number of days, if dose adjustment occurred inpatient.
Presenter Name: Jacobs, Scott  
Organization: Einstein Medical Center Philadelphia  
Category: Transplant  
Day | Session | Room | Time: Tuesday | 3 | Empire C | 1:15:00 PM

Authors: S. Jacobs, J. Vidal, J. Knorr; Einstein Medical Center Philadelphia

Title: Evaluation of the efficacy of IVIG for BKV infection in kidney transplant recipients

Objectives: BK polyomavirus (BKV) occurs in up to 20% of kidney transplant recipients (KTR) and is associated with reduced graft survival and graft function. Intravenous immunoglobulin (IVIG) has been used after reduction of immunosuppression has failed to adequately reduce BK viral load, via passive immunity. The clinical benefits of IVIG are not well described and the optimal dose is unknown. The purpose of this study was to assess the impact of IVIG as a treatment for BKV in KTR.

Methods: This retrospective review included KTR at Einstein Medical Center Philadelphia (EMCP) from January 2015 to December 2020 with a positive serum BKV PCR defined as >1000 copies/mL, who received IVIG for BKV treatment and had evaluable PCRs at 1- and 2-months post-treatment. All KTR were screened with serum BKV PCR every month for the first three months post-transplant, followed by every three months for 1-year post-transplant. Current EMCP guidelines for persistent BKV non-responsive to reduced immunosuppression permit IVIG dosed at 1g/kg every week for two doses. Plasma BKV PCRs were collected at time of initial diagnosis as well as 1-month and 2-months post-IVIG to determine the proportion of patients with a greater than 1-log reduction in BKV PCR. Secondary endpoints were BKV clearance (PCR <1000 copies/mL), sustained clearance (PCR remained <1000 copies/mL after clearance), GFR 1-year post-transplant, rates of rejection 1- and 3-years post-transplant, graft survival and patient survival.

Results: A total of 24 patients were included. The median time from transplant to first positive BKV PCR was 100 days (IQR 64-148). The average initial PCR was 4.17 log10 copies/mL (Â±0.79). Only two (8.7%) patients experienced a 1-log reduction in BKV PCR within two months post-IVIG therapy. Mean PCR 1- and 2-months post-IVIG were 5.29 (Â±0.72) and 4.77 (Â±0.91) log10 copies/mL, respectively. Mean log change in PCR from time of initial diagnosis to 1- and 2 months post-IVIG were +1.12 (Â±1.11) and +0.4 (Â±1.38), respectively. Of the two patients who experienced a 1-log reduction, both occurred at two months post-IVIG. Only one of these patients eventually cleared BKV. In total, 8 (33.4%) patients cleared BKV within 1-year post-IVIG, with 5 (20.8%) patients sustaining viral clearance. The average time to BKV clearance was 343 days (Â±290). At 1- and 3-years post-transplant, 1 (4.2%) and 3 (12.5%) patients experienced acute rejection, respectively. The average GFR at 1-year post-transplant
was 34.4 (±20.3) mL/min/1.73m². All patients reached 1-year graft survival. Patient and graft survival at 3-years was 91.7% and 72.3%, respectively.

**Conclusions:** Despite limited treatment options, IVIG dosed at 1g/kg for two doses was not effective in the treatment of BKV in our patient population. Further studies with larger sample sizes and comparative arms are warranted.
Evaluation of extended cytomegalovirus infection prophylaxis in lung transplant recipients

Kennedy, Katelyn

Objective: Cytomegalovirus (CMV) infection is a contributing factor to worsening mortality and rejection outcomes in lung transplant recipients (LTR). Invasive CMV disease can occur by reactivation of latent infection, donor transmission, or primary infection. Guidelines recommend 6-12 months of CMV prophylaxis for LTR at moderate to high risk for CMV disease as the highest incidence of infection usually occurs in the first several months after transplant. Late onset infection can occur after cessation of prophylaxis. At Temple University Hospital (TUH), providers are extending prophylaxis beyond 12 months to prevent late onset infection. The objective of this study is to evaluate the incidence of CMV viremia in LTR receiving standard CMV prophylaxis (6-12 months) versus extended CMV prophylaxis (>12 months).

Methods: This retrospective, single center, chart review study included patients who received a single or double lung transplant between January 1st, 2012 and August 30th, 2019 at TUH who are at moderate to high risk for CMV disease. Patients were excluded if they received a heart-lung transplant, previous transplant of another organ, retransplantation of the lung, or are stratified as low risk for CMV disease. The primary endpoint was the incidence of CMV viremia defined by a detectable CMV polymerase chain reaction (PCR). Secondary endpoints included peak CMV viral load, time to CMV viremia, incidence of leukopenia and thrombocytopenia, development of ganciclovir/valganciclovir and letermovir resistance, and death from CMV disease. Endpoints were assessed until six months after cessation of prophylaxis. Demographic information was analyzed with descriptive statistics. Categorical data was analyzed by Chi-Square or Fischer's exact test. Parametric, continuous data was analyzed by Student's t-test and non-parametric data by Mann-Whitney U test. To evaluate risk factors associated with the development of CMV viremia, a multivariate logistic regression was performed.

Results: The incidence of CMV viremia will be compared between patients who received standard CMV prophylaxis and extended CMV prophylaxis. Peak CMV viral load, time to CMV viremia, incidence of leukopenia and thrombocytopenia, development of ganciclovir/valganciclovir and letermovir resistance, death from CMV disease, and risk factors associated with the development of CMV viremia will also be reported.
**Conclusions**: It is anticipated that this study will provide insight into whether extending CMV prophylaxis is beneficial in LTR to prevent CMV viremia.
Conference Abstracts  
May 16-18, 2022

Presenter Name: Lee, Joseph  
Organization: Virtua Health  
Category: Transplant  
Day | Session | Room | Time: Tuesday | 4 | Magnolia C | 3:15:00 PM

Authors: Joseph Lee, PharmD; Della Xu, PharmD; Jeanmarie S. Perch, PharmD, BCPS

Title: Evaluation of gastrointestinal events in abdominal transplant recipients maintained on enteric-coated mycophenolate sodium and mycophenolate mofetil

Objectives: Mycophenolate mofetil (MMF) is an immunosuppressive drug that has led to reduced acute rejection and improved graft survival in liver, kidney, and/or pancreas transplant recipients. However, gastrointestinal (GI) adverse events can limit its use, so enteric-coated mycophenolate sodium (EC-MPS) was developed to reduce GI adverse events while maintaining comparable effectiveness in preventing rejection in transplant recipients. The purpose of the study was to evaluate: the incidence of GI side effects from EC-MPS and MMF, the rates of GI-related readmissions, and the management of GI mediated adverse effects in the ambulatory setting post discharge.

Methods: This was a retrospective chart review of abdominal transplant patients who were prescribed EC-MPS or MMF between January 1, 2021 and August 31, 2021. The primary endpoint was the number of reported GI adverse events from EC-MPS and MMF. The secondary endpoints were the number of hospital readmissions due to GI adverse events secondary to EC-MPS and MMF and the number of formulary changes, dose reductions, and discontinuations during hospitalization and post discharge.

Results: Among 209 patients who were initially screened, 171 patients were included in this analysis. Of those 171 patients, 117 patients were prescribed EC-MPS and 54 patients were prescribed MMF. There were 14 patients (12.0%) in the EC-MPS group and 8 patients (14.8%) in the MMF group who reported GI adverse events caused by EC-MPS and MMF respectively. The most common cause of GI adverse events unrelated to either EC-MPS or MMF was Clostridium difficile infection, causing diarrhea in 7 patients. Ten patients (8.5%) in the EC-MPS group and 6 patients (11.1%) in the MMF group were readmitted to the hospital due to GI adverse events. A total of 5 patients required a formulary change, however, none of the formulation changes were due to GI adverse events from either EC-MPS or MMF. Two patients (1.7%) in the EC-MPS group required a dose reduction due to diarrhea. EC-MPS was discontinued in 3 patients (2.6%) due to diarrhea, and MMF was discontinued in 2 patients (3.7%) due to diarrhea and abdominal pain.

Conclusions: The data suggests that patients prescribed MMF experienced more GI adverse events. Additionally, for those who experienced GI adverse events, EC-MPS resulted in less...
hospital readmissions and drug discontinuation compared to MMF. However, more studies are needed to evaluate the clinical significance of these differences in abdominal transplant recipients.
Impact of antifungal prophylaxis on lung transplant recipients and incidence of breakthrough fungal infections

OBJECTIVES: Lung transplant recipients (LTRs) are at increased risk of developing invasive fungal infections (IFIs). Risk factors associated with IFI development include single lung transplant, rejection, and augmented immunosuppression. Utilization of antifungal prophylaxis is standard for most transplant programs, however, consensus on agent and duration of prophylaxis has not yet been established. At the University of Maryland Medical Center (UMMC), voriconazole for ≥6 months is the preferred antifungal prophylaxis agent. However, deviations from protocol may occur secondary to intolerability and provider preference. The primary study objective was to determine the incidence of IFIs post-lung transplant. Secondary objectives included drug intolerability prompting deviations from antifungal prophylaxis protocol.

METHODS: This was a single-center retrospective chart review of patients aged ≥18 years old who received a lung transplant between 1/1/2016 and 3/30/2020. Exclusion criteria included multi-organ transplant, re-transplant, and death within 30 days of transplant. Patients were evaluated for development of fungal infections, antifungal agent use, and variables potentially associated with IFI development. Demographic data was reported as descriptive statistics with mean ± standard deviation or median with interquartile range, as appropriate. Mann-Whitney U test or independent samples t-test was used for continuous variables and chi-square or fisher's exact test was used for categorical variables, as appropriate.

RESULTS: A total of 117 LTRs were included in this study. The majority of patients were Caucasian (71%, N=83) and male (N=73, 62%) with a median age of 63 years (interquartile range 15 years). Approximately two-thirds of patients received a double lung transplant and idiopathic pulmonary fibrosis/ interstitial lung disease was the most common cause of end stage lung disease. Within one year of transplant, 18 (15%) patients developed an IFI. Of the 18 IFIs identified, 11 were breakthrough infections. All infections were pulmonary and the most common organism was Aspergillus (N=11). Of the 115 patients initiated on voriconazole for prophylaxis, 57 (50%) were switched to another agent, most commonly for intolerability secondary to neurotoxicity (N=35, 30%).
**Conclusions:** Overall, there was a low incidence of IFIs and a high incidence of breakthrough infections (9.4%) at one year in patients maintained on antifungal prophylaxis post-transplant. Neurotoxicity was the most common intolerability resulting in conversion of voriconazole to another agent. Further analysis to determine potential reasons for high incidence of breakthrough infections is ongoing.
Early Steroid Withdrawal in Kidney Transplantation: Management of Steroid Tapers for Patients with Delayed Graft Function

Objectives:

Early steroid withdrawal (ESW) is an attractive maintenance immunosuppression option for kidney transplant (KT) recipients due to the potential for avoidance of adverse effects of continued steroid maintenance (CSM). However, efficacy of ESW compared to CSM in those with higher immunologic risk, specifically with delayed graft function (DGF), is not well-studied. The objective of this study is to evaluate outcomes of KT recipients who experienced DGF and underwent ESW compared to outcomes of KT recipients who experienced DGF but did not undergo ESW.

Methods:

This retrospective analysis evaluated patients at a single center who received a KT between August 16, 2016 and June 30, 2020 and experienced DGF. Patients were excluded if they were less than 18 years old, underwent previous or multi-organ transplant, or met criteria for an absolute contraindication to ESW per our transplant center’s immunosuppression protocol. The primary outcome is biopsy proven rejection within 12 months. Secondary outcomes include transplant admission length of stay, readmission(s), allograft failure, terminal serum creatinine, death, estimated glomerular filtration rate (eGFR), proteinuria, de novo donor specific antibody (DSA) development, steroid exposure, hyperlipidemia, and leukopenia or neutropenia. Categorical data uses Pearson chi square tests or Fisher's exact tests. Normally distributed continuous data utilizes a Student’s or Welch’s t-test. All analyses have standardized beta (β) coefficients and odds ratios (OR) with 95% confidence intervals (CI).

Results:

There were no occurrences of biopsy-proven rejection in the ESW group and one occurrence in the CSM group (7.7%) within 12 months of KT. However, when expanding that time frame to any time post-KT, there was one occurrence in both the ESW and CSM groups (2.1% vs 7.7%, p=0.389). The event in the ESW group occurred 686 days after KT, while the event in the CSM group occurred 144 days after KT. There were no statistically significant differences between the ESW and CSM groups for any of the secondary outcomes evaluated in this study, including the rates of allograft failure, DSA development, renal function, leukopenia, or neutropenia.

Conclusions:

The results of this trial, although statistically insignificant for both primary and secondary outcomes, imply that ESW and CSM protocols produce similar outcomes for KT recipients with delayed graft function.
patients experiencing DGF. The limited sample size for both groups preclude the ability to draw definitive conclusions regarding the true impact of steroid maintenance therapy in patients experiencing DGF. Future studies with a larger patient population are needed. The evidence gleaned from this study supports the use of an ESW protocol at our institution and provides evidence, albeit limited, for use of ESW protocols in the setting of DGF.
Findings from pharmacist-performed medication adherence assessments in living donor kidney transplant candidates and missed medication rates early after transplant

Objectives: Evaluation and monitoring for medication non-adherence (NA) is necessary pre- and post-kidney transplant (KTx) to optimize outcomes. This study describes findings following the implementation of a standardized pre-KTx medication adherence assessment questionnaire in living donor (LD) KTx candidates at our center, and analyzes recorded missed medication rates 3 and 6 months (mo) post-KTx.

Methods: This retrospective study included adult HIV-negative candidates who underwent a LD KTx at our center 7/1/2018-12/31/2020 and had ≥ 6 mo of follow up. All candidates were seen by a KTx pharmacist for a standardized medication adherence assessment at their pre-KTx visits and provided education based on findings. Candidates were: 1) considered to have "adherence concerns" if they reported missed or late medications within 2 weeks prior to assessment or ever stopped a medication without medical advice 2) considered "using adherence tools" if they reported pill box use, access to an up-to-date medication list, or use of medication reminder(s). Data on recipients missing medications were collected from standardized provider documentation at 3 and 6 mo post-KTx visits.

Results: Among 183 patients included, 81 (44%) had adherence concerns and 171 (93%) reported using adherence tools pre-KTx. Data collection and analysis are ongoing. Descriptive statistics will be used to describe demographic characteristics and post-KTx missing medications between groups.

Conclusions: It is anticipated that information learned from this study can assist in further refining the KTx pharmacist's approach to medication adherence assessments in LD KTx candidates and may result in modification to our current practice.
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Title: Outcome of Hepatitis C Positive Kidney Donors in Negative Recipients

Objectives: To evaluate the safety of transplanting kidneys from hepatitis C virus (HCV)-infected donors into HCV-uninfected recipients and assess short term outcomes including the occurrence of rejection, renal function, and infections post-transplant.

Methods: From January 2020 to March 2021, a retrospective chart review of patients was conducted to assess short term outcomes including the occurrence of rejection, renal function, and infection post-transplant. A total of 19 HCV nucleic acid amplification testing (NAT) positive kidney donor transplant recipients were identified and matched with 38 HCV NAT negative kidney recipients via stratified random sampling. Primary outcome measures were evaluated at 3 months and 6 months and included biopsy proven rejection, renal function, and infections. Secondary outcome measures were sustained virologic response at 12 weeks post-treatment completion, and time between HCV viral load detection and initiation of HCV treatment.

Results: Incidence of biopsy-proven rejection was found in the HCV NAT negative recipient group (15.8% vs. 10.5% treatment; p = 0.0191). Incidence at 3 months and 6 months post-transplant of positive BK virus titers, positive CMV titers, and urinary tract infection were all statistically nonsignificant. Bloodstream infections at 3 months trended toward statistical significance (2.6% control vs. 10.5% treatment; p = 0.0505), and was statistically significant at 6 months post-transplant (2.6% control vs. 15.8% treatment; p = 0.0191). No intergroup differences were found in post-operative serum creatinine at day 7, at 3 months, or at 6 months.

Conclusions: This single-center retrospective chart review of HCV-positive kidney donor transplant recipients demonstrates a low rate of biopsy confirmed rejection and similar incidence of infection post-transplant to matched negative patients. This study adds to existing literature providing support for the safety of HCV-positive donor kidney transplantation.
Assessing the association between posaconazole trough concentrations and tolerability

Objectives: The use of posaconazole for antifungal prophylaxis and treatment is common in solid organ transplant (SOT) and bone marrow transplant recipients. Previous studies have identified goal concentrations of 0.7 ug/mL and 1 ug/mL for prophylaxis and treatment, respectively. However, no studies have described the relationship between trough concentrations and ADRs. We aimed to characterize associations between serum trough concentrations and adverse events including hepatotoxicity and QTc prolongation.

Methods: This IRB-approved, retrospective cohort study at NewYork-Presbyterian Hospital/Columbia University Irving Medical Center included solid organ transplant recipients that had a posaconazole level drawn between July 1st, 2016 and July 1st, 2021. The primary outcome of this study was to evaluate the relationship between elevated posaconazole trough concentrations and toxicity (hepatotoxicity and QTc prolongation). Hepatotoxicity was defined using the common terminology criteria for adverse events, version 5. A secondary aim of this study was to identify patient factors associated with elevated posaconazole trough levels. Pearson's correlation was used to assess relationships between posaconazole trough concentrations and AST, ALT, alkaline phosphatase, bilirubin, and QTc. Logistic regression was utilized to identify factors associated with a posaconazole trough of ≥ 2.5 ng/mL.

Results: A total of 123 solid organ transplant recipients were included. The average age of the patients included were 57.1 years and the majority were male (56.1%) and having received a lung transplant (88.6%). A total of 1,323 trough levels were assessed with a median number of 8 (IQR, 5-15) levels per patient. The median posaconazole trough concentration was 1.7 ug/mL (IQR, 1.1 – 2.5). There was no correlation observed when assessing the association of elevated posaconazole levels and aspartate aminotransferase (r=0.01), alanine aminotransferase (r=0.02), alkaline phosphatase (r=0.08), and total bilirubin (r=0.01). However, hepatotoxicity was observed in 72.4% of subjects, with the majority classified as grade 1 (65.2%). There was also no correlation between posaconazole trough concentration and QTc interval (r=0.05). Age and female sex were independently associated with having an elevated posaconazole trough concentration ≥2.5 ng/mL, aOR 1.1 (95% CI 1.04-1.06; p<0.001) and 1.99 (95% CI 1.48-2.67; p<0.001), respectively.
Conclusions: This analysis demonstrates no correlation exists between posaconazole levels and hepatotoxicity or QTc prolongation. Based on these results, posaconazole dose adjustments may not be warranted for elevated levels to avert hepatotoxicity or QTc prolongation.
Objectives: Alemtuzumab and rabbit antithymocyte globulin (rATG) are two lymphocyte depleting induction agents used in kidney transplantation. Randomized controlled trials have found that alemtuzumab 30 mg one time and rATG 6 mg/kg divided over four days have similar rates of biopsy proven acute rejection (BPAR), and lower doses (4.5 mg/kg) of rATG have lower rates of complications including cytomegalovirus (CMV) infection and thrombocytopenia while maintaining similar rates of BPAR, when compared to 6 mg/kg of rATG. In 2019, Medstar Georgetown University Hospital (MGUH) transitioned from rATG 6mg/kg to 4.5 mg/kg for standard immunologic risk kidney transplants, when alemtuzumab was unavailable. The objective of this study is to compare the effectiveness and safety of induction immunosuppression with alemtuzumab versus rATG 4.5 mg/kg in kidney transplant recipients.

Methods: This is a single center, retrospective study of kidney transplant recipients from September 2019 to August 2020 at MGUH. Patients included were at standard immunologic risk which was defined as patients between 18 and 70 years old with negative donor specific antibody at the time of transplant. Exclusion criteria included primary non-function of the allograft, HIV positive recipients, and any prior organ transplant within the past year. Patients were compared based on which induction they received, rATG 4.5 mg/kg or alemtuzumab. Comparisons were made between groups analyzing rejection, including both BPAR and antibody mediated rejection, as well as rates of infection. All outcomes were evaluated in the 12 months following transplantation.

Results: Two hundred seven patients were included in the analysis with 113 receiving alemtuzumab and 94 receiving rATG. Baseline characteristics were similar between the groups. Rejection rates were 4.4% and 2.1% in the alemtuzumab and rATG groups respectively (p=0.73). Overall rates of infection were 58% in the alemtuzumab group compared to 45% in the rATG group (p=0.68). Opportunistic infections occurred in more frequently with alemtuzumab than with rATG, 42.5% and 28.7% (p=0.04). CMV viremia was significantly different between groups at 27.4% (alemtuzumab) vs. 11.7% (rATG) (p=0.006).
Conclusions: In standard immunologic risk kidney transplant recipients, rATG 4.5 mg/kg had similar rates of rejection as alemtuzumab and is associated with a lower risk of post-transplant opportunistic infections, specifically CMV viremia.
Objectives: Transplant pharmacists at the Johns Hopkins Hospital (JHH) spend a significant amount of time providing patient education at the bedside in preparation for discharge. Due to financial incentives pushing the duration of hospital stays to become shorter, it may be challenging to arrange discharge education for transplant recipients without time conflicts with other inpatient services or caregiver availability while also ensuring patients' mental status makes them appropriate for education. The adoption of digital multimedia content for patient education can increase engagement for patients with diverse learning styles while simultaneously reducing potential time conflicts in hospital practice. The purpose of this study is to develop video education materials for discharge teaching of post-transplant recipients at JHH and to assess the effectiveness in increasing patient knowledge, as well as patient satisfaction compared to the current standard of care of fully-in person education. This study will also determine if any reduction in pharmacists' time occurs in the intervention group.

Methods: This prospective study has been approved by the Institutional Review Board. The multidisciplinary team identified patients having received a solid organ transplant between March 2022 and May 2022 to be screened for inclusion on the initial admission after transplant surgery. Patients were eligible for in the standard of care group if appropriate for education in the first 2 weeks of the research study. Patients were eligible for the intervention group if appropriate for education after the first 2 weeks until the end of data collection. The electronic medical record was utilized to collect any baseline characteristics information from patients’ charts. The following data was collected around the discharge educational session: patient pre- and post-knowledge assessment, patient satisfaction questionnaire, and pharmacist time spent with patient for discharge education.

Results: The primary outcome will be the difference in effectiveness of education methods through analyzing results of pre- and post-education patient knowledge questionnaire. Secondary outcomes will include differences in patient satisfaction education methods as well as differences in pharmacists' educational time requirements. Expected final results in May 2022.
**Conclusions:** The outcomes may impact transplant pharmacy services at JHH by providing transplant pharmacists with more flexibility to complete corresponding clinical duties and optimize pharmacy workflow operations. The study contributes to the literature by assessing the effectiveness of discharge education video(s) on patient satisfaction and knowledge levels which are currently limited.
Evaluation of Valganciclovir Dosing Strategies for Cytomegalovirus Prophylaxis in High-risk Adult Renal Transplant Recipients

Objectives: Valganciclovir 900 mg daily (standard-dose) is widely used for Cytomegalovirus (CMV) prevention in high-risk solid organ transplant patients. Valganciclovir dosing practices vary between standard-dose valganciclovir for 9 months at NewYork-Presbyterian Hospital/Columbia University Irving Medical Center (NYP/CUIMC) and valganciclovir 450 mg daily (low-dose) for 6 months at NewYork-Presbyterian Hospital/Weill Cornell Medical Center (NYP/WCMC), renally dose-adjusted as appropriate. The purpose of this study is to compare the incidence of CMV viremia, defined as CMV PCR >500 IU/mL, and drug toxicity of standard-dose versus low-dose valganciclovir prophylaxis.

Methods: This is a dual IRB-approved, retrospective analysis of CMV high-risk adults who underwent renal transplantation at NYP/CUIMC or NYP/WCMC between 01/01/16-11/27/20. Patients who received multi-organ transplants, enrolled into prospective clinical trials, or had less than 15 months of follow-up were excluded. Statistical analyses will be conducted on Stata 14.2 and includes descriptive statistics, as well as Pearson's chi-squared test or Fischer's exact test for categorical variables and Wilcoxon rank-sum test for continuous variables, respectively. Cumulative incidence curve of CMV viremia will be constructed with death, biopsy-proven rejection, or premature discontinuation of valganciclovir prophylaxis prior to protocol-defined treatment end date, as the competing risks using the Fine and Gray method.

Results: The incidence of CMV viremia and other competing risks will be identified and results will be presented.

Conclusions: It is anticipated that this project will help elucidate best practices for valganciclovir dosing in CMV high-risk renal transplant recipients at NYP/CUIMC and NYP/WCMC.