MSHP Pharmascript

Volume 41, Issue No.3,
Supplement 1
Third Quarter

Special Edition: 2017 Pharmacy Resident Abstracts

What's Inside This Issue?

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Analysis of predicted benefits through incorporating rapid identification testing for gram positive blood cultures in an acute-care, community hospital

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Objective: Traditional organism culture and identification can take 72-96 hours before susceptibilities are known, during which patients receive multiple broad spectrum antibiotic doses that are potentially unnecessary. With new diagnostic technology, final species identification can occur within hours allowing fewer doses of broad spectrum antibiotics, and earlier initiation of deescalated therapy. The primary objective was to determine the mean time to targeted antibiotic therapy for gram positive bacteremia following final cultures. The secondary objects included evaluating the use of vancomycin relative to final culture data and determining the difference in length of stay and in-hospital mortality between the two studied groups (vancomycin indicated vs. vancomycin not indicated).

Methods: Data regarding gram positive cultures that resulted from August 1, 2015 through July 31, 2016 was reviewed in a retrospective analysis. Patients ≥18 years of age with gram positive blood cultures who were treated with intravenous vancomycin were included. Patients were excluded if they were pregnant or incarcerated, did not receive antibiotic therapy during hospital stay, received intravenous vancomycin for a non-bacteremic infection, had antibiotics administered prior to culture collection, or had a culture result that was known at the time of admission. Additionally, only the first positive culture from admission were analyzed. Data collection included, but was not limited to, baseline demographics, identified pathogen, duration of broad spectrum therapy, time (hours) from culture collection to final speciation and susceptibility, resulting speciation as contaminant or infection, antibiotic(s) administered, length of stay, and in-hospital mortality.

Results: Of the 706 gram-positive blood cultures that resulted between August 1, 2015 through July 31, 2016, 229 were included in the final data analysis. 57.6% were males, with a mean age of 73.3 ± 14.8 years and a median weight of 74.8 (± 24.5) kg. Approximately 25% of the patients were treated in the intensive care unit during some point of their admission. Bacterial isolates showed that 47.6% were coagulase-negative *staphylococcus*, 12.7% were methicillin-sensitive *staphylococcus aureus,* and 10.0% were methicillin-resistant *staphylococcus aureus.* Evaluation of the antibiotic use based on final culture data indicated that 49.8% of the pathogens were found to be contaminants, 32.3% were found to have a better therapeutic alternative available (i.e. de-escalation), and 15.7% were found to have vancomycin as the appropriate initial therapy. Results indicated that it took a median time of 58.37 (± 2:38) hours to final speciation and susceptibilities, and 47:50 (± 1.90) hours to de-escalation or discontinuation of unneeded empirical therapy. Hospital length of stay was found to be significantly longer in the vancomycin indicated group (9 vs 7 days; p=0.027). Although in-hospital mortality was not found to be statistically significant, it was higher in the vancomycin not indicated group (1 vs 14 patients; p=0.478). Additionally an excess of 846,250 mg of vancomycin was used which equates to $2,753.13 with an average excess of 55:22 hours of therapy.

Conclusion: This study shows the potential utility that rapid diagnostic technology may play in an acute-care community hospital in reducing overall costs and overuse of broad spectrum antibiotics. The high incidence of contaminants highlights the need for staff education in appropriately drawing blood cultures so as to reduce contaminants and overuse of broad spectrum antibiotics. The benefits associated with rapid diagnostic technology is tremendous. The costs saved extend beyond medication costs, and may also decrease length of stay, in-hospital mortality, and resistance rates, although further studies are warranted.

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An evaluation of provider-chosen antibiotic indications as a targeted antimicrobial stewardship intervention.

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BACKGROUND: In 2016, the Infectious Disease Society of America and the Society for Healthcare Epidemiology of America issued new guidelines on the implementation of AS programs. These guidelines promote the establishment of process and outcome measures to determine the impact of AS initiatives on antimicrobial use. The Joint Commission (JC) and Centers for Medicare and Medicaid Services (CMS) have also issued statements regarding the implementation and continuation of AS in institutional settings. In order to meet the JC standard, hospitals and nursing care centers are required to monitor antibiotic prescribing patterns. CMS proposed a core measure of promoting guideline-driven use of antibiotics and are evaluating institutions for development of a targeted intervention to improve an area of antibiotic prescribing. One of Johns Hopkins Bayview Medical Center's targeted interventions included creating a "limited indication" designation for cefepime, vancomycin, levofloxacin, ciprofloxacin and moxifloxacin. When a provider goes to order a "limited indication" antibiotic they are required to either pick a prepopulated indication or choose "other" and type in an indication for use. Providers are unable to place the order without the indication specified. This stewardship tool was created to evaluate whether providers are using antibiotics in an evidence-based manner and to move towards compliance with JC measures.

OBJECTIVE: The primary objectives were to assess whether the "limited indication" chosen when ordering the antibiotic matches the patient's diagnosis and to assess whether the "limited indication" antibiotic is clinically appropriate. The secondary objective was to characterize the use of the "other" free text indication for the "limited indication" antibiotics.

METHODS: Antibiotic utilization appropriateness was evaluated by using existing guideline-driven hospital created treatment algorithms. Patients were identified by having a "limited indication" antibiotic ordered and documented as administered in our EMR. Due to concern for transcription error, orders entered by pharmacists were excluded. A retrospective analysis was performed of medical records from patients presenting between April 1, 2016 and June 30, 2016. The records of patients who met inclusion criteria were analyzed by the investigators using the guideline-driven algorithms.

RESULTS: The results presented are preliminary. The "limited indication" antibiotics were determined to be mismatched if the indication chosen in the order did not match the indication documented in the EMR. Orders that were determined to be mismatched were further categorized as being a complete mismatch or a failure of indication. The "limited indication" antibiotics were labeled as a complete mismatch if the indication chosen was entirely different than the infection indicated in the EMR. The "limited indication" antibiotics were labeled as a failure of indication if the indication chosen was the closest available option among the indications available to what was documented in the EMR. The "other" indication comments were categorized based on the type of infection (i.e. "Cellulitis" classified as "Skin and soft tissue infection (SSTI)"). The mismatch rates were 20% for vancomycin, 22% for cefepime, and 26% for the fluoroquinolones. Vancomycin had 69% of mismatches being a complete mismatch, cefepime had a 50% complete mismatch and 50% failure of indication, and the fluoroquinolones had 73% failure of indications. Vancomycin had 94% clinical appropriateness and cefepime had 100% appropriateness, but the fluoroquinolones had 68% clinical appropriateness and 32% clinical inappropriateness. For the secondary objective, vancomycin orders mainly used the "other" indication for sepsis or skin and SSTI, cefepime was mainly used for SSTI, and the fluoroquinolones for respiratory infections.

CONCLUSIONS: In conclusion, the preliminary results illustrating 20-26% of all "limited indication" antibiotic orders were mismatched point to a need for re-evaluation of our current indications. Additionally, 32% of the fluoroquinolone orders being clinically inappropriate indicates the need for education to our providers to ensure that they are aware of when they should be utilizing an order set, or which indication selection is appropriate based on different scenarios.

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Comparison of taste and palatability preferences of pediatric volunteers to an adult cohort

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OBJECTIVE: Palatability of medications in pediatric patients threatens adherence and clinical outcomes; therefore, developing palatable medications is critical to improve pediatric outcomes. Furthermore, there is a paucity of data relating the taste preferences of children and adults to drug development. The purpose of this study is to measure and compare the taste and palatability preferences of pediatric volunteers to an adult cohort.

METHODS: The study is a double blind, crossover, prospective taste and palatability survey comparing pediatric patients to an adult cohort from a previous study. Local pediatric volunteers will be recruited to sample four laboratory-created formulations and subsequently answer survey questions related to those samples. The formulation components will include differing amounts of ranitidine hydrochloride (bitter), sucrose (sweet), microcrystalline cellulose (viscosity), calcium phosphate (chalkiness), and sodium benzoate (preservative). The sample formulations will be presented in a randomized fashion and participants will complete a survey immediately following tasting. The survey will use a modified facial hedonic scale to measure palatability of each formulation and the pediatric patients will rank the formulations to determine which is preferred.

RESULTS: Results expected by May 2017. The preferences of the pediatric and adult patients will be presented.

CONCLUSION: The authors anticipate that this study will provide valuable information regarding the palatability differences between adults and children, as well as insight into components of medications preferred by pediatric patients to aid in the development of more palatable substances.

Comparison of warfarin dosing requirements before and after intravenous (IV) inotrope initiation in acutely ill patients with advanced heart failure

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OBJECTIVE: In patients with advanced heart failure, both decreased cardiac output and tissue perfusion impair the liver's ability to metabolize drugs, leading to decreased dose requirements. On the other hand, heart failure patients requiring therapy with IV inotropes (either as palliation or bridge to transplant) in turn, experience increased cardiac output. Therefore these patients may require increased doses of hepatically-metabolized drugs. The objective of this study is to determine the mean difference, if such a difference exists, between warfarin dose requirements for the period up to 3 months pre- and post-IV inotrope initiation in patients with advanced heart failure. Our secondary objective is to determine the mean difference in international normalized ratio (INR) for these patient during the same period.

METHODS: This study is a retrospective pilot analysis of patients at least 18 years of age on chronic anticoagulation with warfarin and with a diagnosis of advanced heart failure with reduced left ventricular ejection fraction (HFrEF ≤ 40 percent) requiring long-term inotrope therapy who were admitted to the Advanced Heart Failure Service at UMMC between May 1, 2010 and May 1, 2015. Our exclusion criteria includes patients who were actively bleeding during hospitalization, received IV inotrope therapy for an indication other than decompensated heart failure, were on IV inotrope therapy for short-term use only, were admitted on an IV inotrope, or expired during hospitalization. Paired t-test or Wilcoxon signed-rank test were performed to measure a significant difference in the primary and secondary outcomes. Analyses were performed with SAS version 9.4 (SAS Institute, Cary, NC).

RESULTS: A total of 328 patient encounters were analyzed during the 5-year study period. Overall, 318 were excluded. A majority of encounters (n = 199; 60.7%) were excluded due to patient receiving IV inotrope therapy for short-term use only. For the subset of patients remaining (n = 10), the mean age was 59.6 years, 70% of patients were male, and 80% were Caucasian. The most common primary indication for warfarin therapy was atrial fibrillation (n = 5). Eighty percent of patients had a recorded left ventricular ejection fraction of less than 15%. There was no statistically significant difference in mean weekly warfarin doses between pre- and post-IV inotrope groups (25.0, 29.2; p = 0.12, 95% CI -9.68-1.28). There was a significant difference in mean INR between pre- and post-IV inotrope groups (2.8, 2.1; p = 0.016). Zero patients experienced myocardial infarction, venous thromboembolism, cerebral vascular accident, or major bleeding during the study period.

CONCLUSION: Initiation of long-term IV inotrope therapy was associated with a trend for increased warfarin dose requirement in this small pilot study, which may indicate the possibility of a significant finding with a larger sample size. After initiation of an IV-inotrope, there was a statistically significant decrease in the cohort's mean INR. A prospective study including more patients may help elucidate whether this difference is clinically significant.

Empiric antimicrobial utilization for pneumonia among patients admitted to a neurocritical care unit

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OBJECTIVE: Current literature reports that 50.5% of critically ill patients across all types of intensive care units (ICUs) are continued on broad-spectrum antibiotics beyond 72 hours, despite no confirmed infection. Patients in the neurocritical care unit (NCCU) are at a higher risk of central fever, making it more difficult to differentiate central from infectious fevers. We hypothesize that there is an even higher incidence of prolonged empiric antibiotic use without a guideline-based indication in the neurocritical care population specifically.

METHODS: This is a retrospective chart review of adult patients who were treated with antibiotics for pneumonia in the NCCU at University of Maryland Medical Center between November 2015 and August 2016. The primary objective was to determine adherence to guideline-based recommendations regarding indications to treat, selection of empiric antibiotic, 72-hour de-escalation, and length of treatment. Patients met an indication to treat pneumonia if they had a clinical pulmonary infection score greater than 6, or met the CDC criteria for pneumonia. To assess 72-hour de-escalation, antibiotic regimens were considered either restrictive, definitive, or prolonged empiric antibiotic therapy (PEAT), with PEAT representing those antibiotics that should have been de-escalated or discontinued based on culture data at 72 hours.

RESULTS: A total of 95 patients were included in this study. Only 24.2% of patients met the indication to treat based on CPIS, and 36.8% of patients based on CDC criteria. The most commonly prescribed empiric antibiotics were vancomycin (58.9%) and piperacillin-tazobactam (56.8%). All other antibiotics were used for <10% of patients in the empiric setting. At 72 hours after antibiotic initiation, only 51.1% of patients had positive sputum or bronchial lavage culture data. 58.9% of all antibiotic regimens were considered to be PEAT, with 84.8% of culture-negative patients continued on therapy beyond 72 hours. Median duration of antibiotics were similar regardless of CPIS (CPIS $\leq$6: 6.7 days vs. CPIS >6: 7.2 days) or CDC criteria (met criteria: 6.9 days vs. did not meet criteria: 6.8 days). Median duration was shorter in patients with negative culture results compared to those with positive culture results (6.1 days [IQR 4.0-8.3] vs. 7.2 days [IQR 5.8-10.3], p<0.05).

CONCLUSION: The incidence of prolonged empiric antibiotic use was higher in the neurocritical care population than has been previously reported across all ICUs (58.9% and 50.5%, respectively). Our data suggests that prolonged empiric antibiotic use beyond 72 hours is of particular concern in the subset of patients with negative cultures. Additionally, patients that did not meet criteria for pneumonia based on CPIS or CDC criteria were still given 7 days of treatment. Culture-negative patients were given shorter durations of therapy compared to culture-positive patients, but were still given close to the full treatment course for pneumonia.

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Evaluation of prophylactic antibiotic use for implantable cardioverter defibrillators

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Objective: The objective of this study was to determine the compliance rate with the institution's guideline for peri-procedural antimicrobial prophylaxis during implantation of automatic implantable cardioverter-defibrillator devices (AICDs). This institutional guideline was implemented in 2015 to provide standardization regarding peri-procedural antibiotic choice and dosing for patients receiving cardiac devices. The guideline indicates which patients should receive cefazolin, vancomycin, and/or clindamycin based on penicillin allergy status, the presence of methicillin resistant *Staphylococcus aureus* (MRSA) risk factors, and procedure type. The guideline also provides recommendations regarding timing of administration and weight based dosing.

Methods: Patients who had an AICD placed at The Johns Hopkins Hospital between September 1, 2015 and February 17, 2016 were identified through the ICD Registry™. Patients were excluded if they received systemic antibiotic therapy at time of implantation, had an active AICD infection, or expired peri-operatively. The primary endpoint of this study is the overall compliance rate to the guideline. Overall compliance was defined as patients who received the correct drug and the appropriate dose, which was timed properly in relation to AICD implantation. Secondary endpoints evaluated included the nature of noncompliance and 30- and 90-day infection rates.

Results: One hundred fifty patients were screened, and 131 met criteria for inclusion. The majority of patients underwent initial AICD implantation (58.8%). MRSA colonization was unknown for 71% of patients, and 87.8% did not have penicillin or cephalosporin allergies. Forty-four percent of patients received pre-procedural antibiotics in compliance with the institutional guideline. In regards to drug selection, 25% of patients received incorrect antibiotics based on one or more of the following indications: procedure type, the presence or absence of antibiotic allergies, or the presence or absence of MRSA risk factors. Ten patients did not receive an indicated antibiotic, and 33 patients received antibiotics for which an indication was not present. There were 195 pre-procedural antibiotic doses administered to patients in this study of which 23% were inappropriately timed and 6% were incorrectly dosed based on weight. There were no infections seen at 30 and 90 days.

Conclusion: Over half of patients received pre-procedural antibiotics that were noncompliant to the institutional guideline. There was no evidence of infection in patients evaluated in this study.

Glucose management after an open Whipple procedure: An evaluation of postoperative insulin administration

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Objective: Challenges with glycemic control are often encountered in the post-operative period following a sub-total pancreatectomy specifically including the open Whipple population. Although previous studies have demonstrated an association between hyperglycemia and poor clinical outcomes in various critically ill populations including an increase in post-operative infection, hypoglycemia has been associated with increased mortality. Previous studies have investigated optimal glucose targets in the critically ill, and while a target glucose range of 140 – 180 mg/dL is considered desirable in most critically ill populations, there is more recent data suggesting that tighter glycemic control after subtotal pancreatectomy may lead to a decrease in surgical site infections as well as a reduction in the development of a pancreatic fistulae. Currently, the optimal management of glycemic control and goal glucose targets for improved clinical outcomes in these patients is unclear. The objective of this study is to determine the optimal method of insulin administration and target glucose goal in patients undergoing an open Whipple procedure at The Johns Hopkins Hospital.

Methods: This study will be a retrospective, observational, cohort study that will be conducted by chart review for all patients admitted to a surgical ICU status post an open Whipple procedure between April 2015 and April 2016. Each patient's glycemic management was assessed based on type of insulin modality utilized, rate of hyperglycemic and hypoglycemic events and minimum and maximum glucose values within the first 24 hours post-surgery. The degree of hyperglycemia and hypoglycemia were also assessed. Study endpoints will include rates of hyperglycemia, hypoglycemia and glucose variance associated with various modalities of insulin administration. Primary clinical outcomes including rates of deep or superficial surgical site infections, development of pancreatic fistulae, ICU and hospital length of stay, and mortality at 90 days will be assessed between patients who develop hypoglycemia or hyperglycemia and those who do not.

Results: A total of 244 patients were included in our study. In our population, 55 (22.5%) carried a diagnosis of diabetes prior to the Whipple procedure and 28 (11.5%) were already on insulin therapy. The median A1C of those with recorded values (n=90) was 6.2 with 28/90 patients with an A1C greater than 7%. The median duration of surgery was 7 hours with a median estimated blood loss of 600 mL. Within the first 24 hours after surgery, 42 (17.2%) of our patients received a somatostatin analogue. The median length of day was 9 days in hospital and 1 day in the ICU. 25 patients (10.3%) had at least one readmission to the ICU and 5 (2.1%) had a repeat laparotomy. During the first 24 hours, the majority of patients, 170 (69.7%) were prescribed sliding scale insulin and 73 (29.9%) were maintained on an insulin infusion. The median glucose at the start of infusion was 181 and end of infusion was 127. With these insulin regimens, there was a total of 16 (6.6%) who had at least one hypoglycemic episode (< 70 mg/dL) and a total of 114 (46.7%) had at least one hyperglycemic (> 180 mg/dL) episode during the first 24 hours. Of those with hypoglycemic events, the insulin modality was mostly split between an infusion (47%) and sliding scale insulin (41%). The majority of our population, 234 (95.9%) was discharged home and 34 patients (13.9%) were discharged on insulin.
Conclusion: The majority of our population were prescribed sliding scale insulin during the first 24 hours post-operatively. The overall rates of hypoglycemia were low during the first 24 hours, however, the rates of hyperglycemia were much higher suggesting that glucose control post-Whipple can be further optimized.

Evaluating the discontinuation rate of dofetilide therapy for QTc prolongation or torsades

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OBJECTIVE: Atrial fibrillation (AF) is a supraventricular tachyarrhythmia characterized by uncoordinated atrial activity with deterioration of mechanical function. Dofetilide, a class III antiarrhythmic medication, is utilized to establish normal sinus rhythm in patients with atrial fibrillation or atrial flutter. Because of the risk for QTc prolongation and torsades de pointes (TdP), dofetilide must be initiated in a hospital setting with continuous electrocardiographic monitoring. Although large clinical trials report less than 3% of patients require dofetilide discontinuation due to QTc prolongation or TdP, smaller retrospective studies reflecting real-world use of dofetilide report higher discontinuation rates ranging from 7.5-32%. A few factors have been proven to increase the QTc, however many of these factors have not been substantiated for dofetilide.

METHODS: This was a single-center, retrospective cohort study of adult patients undergoing dofetilide initiation at The Johns Hopkins Hospital between January 2013 and June 2016. Failure was defined as patients who discontinued dofetilide due to QTc prolongation or ventricular tachycardia during initiation of therapy. Patients were excluded from this study if dofetilide was discontinued due to any other reasons besides QTc prolongation or TdP, or if they were started on dofetilide for ventricular arrhythmias.

RESULTS: A total of 143 patients met the inclusion criteria. The median age was 65 $\pm$ 14 years and many of the patients were white (91%). Dofetilide was discontinued in 24 patients (17%), 18 patients (13%) due to QTc prolongation and 6 patients (4%) developed ventricular tachycardia. Patients with a baseline QTc >440 msec experienced a higher rate of failure (58% vs 29%,

RR=2.77 p=0.005). There was also a significantly higher rate of discontinuation in patients receiving at least one QTc prolonging medication interaction (25% vs 8%, RR=2.65 p=0.019). Rates of failure were higher among patients who had a potassium below 4.0 mg/dL during their inpatient stay (63% vs 29%, RR 3.53 p=0.002) or a magnesium level less than 1.8 mg/dL during their inpatient stay (21% vs 7%, RR 2.63 p=0.028). Rates of failure were even higher in patients who had both hypokalemia and hypomagnesemia (21% vs 1%, RR 6.01 p<0.001). All the statistically significant results from univariate analysis were analyzed in the multivariate logistic regression. Controlling for gender, heart failure, serum potassium, QTc drug interactions, baseline QTc, magnesium was shown to be independently associated with increased risk of failure (OR 4.16, p=0.039).

CONCLUSION: The number of patients that discontinued dofetilide therapy due to QTc prolongation or ventricular tachycardias were higher than what was reported in clinical trials. This study identifies several risk factors for failure, including baseline QTc, hypokalemia, hypomagnesemia and drug interactions. Importantly, many of these risk factors are modifiable, and suggests that optimizing patient management can increase the risk of successful initiation of dofetilide.

Evaluation of Prescribing Patterns of Antithrombotic and Antiplatelet Agents Following Transcatheter Aortic Valve Replacement

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Background: Transcatheter aortic valve replacement (TAVR) has emerged as a standard procedure for patients with severe aortic stenosis who are at prohibitive or high risk of complications from open surgical valve replacement. The optimal antithrombotic therapy following TAVR is an area of ongoing clinical debate. The 2014 AHA/ACC Guidelines on Valvular Heart Disease and the 2012 ACCF/AATS/SCAI/STS Consensus Document on TAVR recommend clopidogrel 75 mg daily with low-dose aspirin for 6 months post-TAVR, followed by low-dose aspirin indefinitely. Since the publication of the guidelines, several studies have suggested that single-antiplatelet therapy (SAPT) may be sufficient for stroke prevention. Likewise, the 2017 Focused Update to the AHA/ACC Guidelines for Valvular Heart Disease state that it is reasonable to use warfarin for at least 3 months. There is also controversy surrounding the management of patients who have an indication for anticoagulation.

Methods: A retrospective review of patients undergoing successful TAVR at The Johns Hopkins Hospital from January 1, 2015 to September 30, 2016 was conducted. The primary objective of the study was to characterize the use of antithrombotic and antiplatelet regimens after TAVR. Secondary outcomes included overall and cardiovascular mortality, myocardial infarction, cerebrovascular events, life-threatening bleeding, major and minor bleeding, and major and minor vascular complications. Antithrombotic and antiplatelet medications at discharge, 30 days, and 1 year was also assessed.

Results: Of 160 patients, 81 (50.6%) patients were discharged on dual antiplatelet therapy (DAPT), 7 (4.4%) patients on SAPT, 18 (11.3%) patients on anticoagulation alone, 48 (30.0%) patients on an antiplatelet agent plus anticoagulation, and 3 (1.9%) patients on triple therapy. Patients' preadmission medications and in-hospital events were primary determinants of the medication regimen at discharge. Patients with an indication for anticoagulation were more likely to be discharged on one antiplatelet agent plus anticoagulation. Ischemic and bleeding events, and vascular complications were rare at 30 days. There were two deaths, one in-hospital and one within 30 days from TAVR.

Conclusion: Currently, there is a paucity of robust data surrounding the use of antithrombotic and antiplatelet agents following TAVR, however at The Johns Hopkins Hospital, the majority of patients are continued on an antithrombotic regimen similar to their preadmission medication regimen unless there is an indication for anticoagulation. Larger studies are needed to assess the effects of these regimens on clinical outcomes.

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Evaluation of the prescribing patterns of $P2Y_{12}$ inhibitors at an academic medical center

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OBJECTIVE: Each year, approximately 1.4 million people in the United States are hospitalized for acute coronary syndrome (ACS). Dual antiplatelet therapy is the primary treatment modality regardless of revascularization strategy and utilizes a $P2Y_{12}$ inhibitor (clopidogrel [C], ticagrelor [T], or prasugrel [P]) in addition to aspirin. On March 8, 2016, the emergency department (ED) at The Johns Hopkins Hospital (JHH) began using ticagrelor preferentially for patients presenting with ACS because of the demonstrated superiority of ticagrelor in the PLATO trial. The objective of this project was to understand how preferentially utilizing ticagrelor for patients presenting with ACS to the ED affected prescribing patterns of P2Y12 inhibitors and patient outcomes.

METHODS: This single-center, retrospective analysis includes all patients who presented to JHH with ACS between September 8, 2015 to September 8, 2016 who were included in the ACTION Registry, a quality improvement registry for STEMI and NSTEMI patients. The pre-intervention group (pre) consisted of those patients who presented September 8, 2015 to March 8, 2016, and the post-intervention group (post) included the patients from March 9, 2016 to September 8, 2016. The utilization of P2Y12 inhibitors on admission and discharge between these two groups was compared using a Chi-squared test, as well as an interrupted-time series analysis. Additional subgroup analyses were performed to investigate the use of triple therapy vs dual therapy for patients who require oral anticoagulation and stratify complication and readmission rates by the agent ordered on admission and prescribed at discharge.

RESULTS: A total of 237 patients were evaluated (127 pre vs. 110 post). Of these, 124 individuals underwent PCI (71 pre vs. 53 post), and 49 individuals underwent CABG (28 pre vs. 21 post). Additionally, 103 patients evaluated were transferred from an outside institution, and therefore bypassed the intervention made in the ED. There was a significant difference in antiplatelet agent utilization in the first 24 hours between the two groups (C=94.1%, P=1.7%, T=4.2% vs. C=50.5%, P=1%, T=48.5%; $p<0.0001$), as well as on discharge (C=85.5%, P=6.7%, T=7.8% vs. C=71.1%, P=5.3%, T=23.6%; $p=0.017$). A total of 28 patients were receiving oral anticoagulation on discharge and of those, 6 patients (21%) were discharged on triple therapy. For patients requiring long-term anticoagulation, the most common combination on discharge was clopidogrel with warfarin. There was no significant difference in bleeding, reinfarction, or stroke during the initial hospitalization, or 30 and 90 day readmission rates, based on the $P2Y_{12}$ inhibitor utilized.

CONCLUSIONS: Preferentially utilizing ticagrelor in patients admitted through the emergency department for ACS at a large academic medical center led to an increased utilization of ticagrelor on admission, as well as on discharge. Following the intervention, no difference in safety, efficacy, or length of stay was observed.

Evaluation of somatostatin analogs for the prevention of post-operative pancreatic fistulas

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Objective: Post-operative pancreatic fistula (POPF) is the most common major complication after pancreatectomy. Patients who develop POPF have an increased risk of mortality. The objective of this study was to evaluate the rate of POPF and

adverse events in patients undergoing distal pancreatectomies and pancreaticoduodenectomies with the use of pasireotide and octreotide.

Methods: This study was a retrospective, observational, single-center, matched cohort study looking at patients ≥ 18 years old, who underwent a distal pancreatectomy or pancreaticoduodenectomy, and received pasireotide or octreotide prophylactically on post-operative day 0 or 1. Patients who received pasireotide were matched to patients who received octreotide in a 1:1 ratio based upon the following characteristics: type of procedure (distal pancreatectomy, pancreaticoduodenectomy), pancreatic gland texture (soft, hard), and pancreatic duct size (narrow, dilated). Patients were enrolled into each study arm in reverse chronological order beginning December 31st, 2016, until enrollment into each study arm reached the 1:1 ratio.

Results: 50 patients were matched, with 25 patients included in each group. 96% underwent a pancreaticoduodenectomy, 92% had a soft pancreatic gland texture, and 92% had a dilated pancreatic duct. The primary endpoint of 30-day incidence of POPF occurred in 3 patients (12%) who received pasireotide and 13 patients (52%) who received octreotide ($p = 0.005$). When comparing the pasireotide group to the octreotide group, there were no significant differences in maximum QTc (475 msec vs 462 msec, $p = 0.934$), maximum blood glucose (188 mg/dL vs 170 mg/dL, $p = 0.174$), delayed gastric emptying (12% vs 28%, $p = 0.289$), or antiemetic use (64% vs 80%, $p = 0.208$). There were no significant differences in 30-day readmission (36% vs 24%, $p = 0.355$) and 30-day mortality (0% vs 0%, $p = 1.00$). The pasireotide group had a lower length of stay compared to octreotide group (9 days vs 12 days, $p = 0.002$). The multivariate logistic regression revealed an odds ratio of 11.9 (95% CI 2.3-60.5, $p = 0.003$) for the 30-day incidence of POPF in the octreotide group compared to the pasireotide group, adjusted for age, body mass index, and intraoperative blood loss. Patients in the pasireotide group had less days of prophylaxis compared to the octreotide group (6 days vs 8 days, $p = 0.0001$).

Conclusion: In conclusion, prophylaxis with pasireotide was associated with a significantly reduced incidence of POPF compared to prophylaxis with octreotide in patients undergoing a pancreatectomy. A decreased length of stay was seen in the pasireotide group. The use of pasireotide at The Johns Hopkins Hospital (JHH) was primarily in patients at higher risk for developing POPF, evident from the significant amount of patients who had a soft pancreatic gland texture. Furthermore, patients in the pasireotide group used less days of prophylaxis compared to the octreotide group.

Incidence of intractable nausea and vomiting in non-small-cell lung cancer (NSCLC) patients receiving moderate-emetogenic chemotherapy regimens

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OBJECTIVE: Well-controlled chemotherapy-induced nausea and vomiting (CINV) is paramount to preserving patients' quality of life while managing patients' underlying malignancy. Inappropriate CINV prophylaxis is associated with higher utilization of health care resources, including emergency department (ED) visits. Moderate emetogenic risk chemotherapy (MEC) includes chemotherapy agents that have a wide range of 30%-90% risk for emesis without prophylaxis. This makes patients treated with standard CINV prophylaxis regimens at risk for inappropriate CINV control, potentially leading to admissions and ED visits. The objective of this study was to evaluate if standard antiemetic regimens for MEC are adequately controlling CINV by identifying the incidence of admission due to intractable nausea and vomiting.

METHODS: In this retrospective cohort analysis, all NSCLC patients who received their first cycle of MEC during a six-month time period beginning in January 2016 were included in the study. We reviewed electronic medical records for any admissions due to intractable nausea and vomiting during a ninety-day observation period that began on the first day of the first chemotherapy cycle. The primary endpoint was to determine the rate of first inpatient admissions or ED visits due to intractable nausea and vomiting of NSCLC patients treated with MEC regimens at Johns Hopkins Bayview Medical Center

(JHBMC). Secondary objectives included identifying risk factors for admission, comparing admission rates in patients who received standard versus modified antiemetic regimens, and identifying dose adjustments associated with intractable nausea and vomiting. Variables collected included patient demographics, performance status, NSCLC histology, chemotherapy regimen, CINV prophylaxis regimen, time between admission and exposure to chemotherapy, length of stay, and chemotherapy dose adjustments. The results were evaluated using descriptive statistics.

RESULTS: There were 235 patients screened and 228 patients excluded. The remaining seven patients were not admitted for intractable nausea and vomiting during the study period, resulting in zero patients accrued to the comparator cohort of patients. The majority of included patients were male (57.1%) smokers (85.7%) with stage IV (85.7%) adenocarcinoma (71.4%). All patients received a combination chemotherapy plan with carboplatin at an area under the curve (AUC) of five or six. One patient received a modified antiemetic regimen that added fosaprepitant on day one. There were no CINV-related chemotherapy dose adjustments. The incidence of admission due to chemotherapy-induced intractable nausea and vomiting was zero, thus preventing the assessment of secondary endpoints.

CONCLUSION: Since there were zero admissions due to CINV, standard antiemetic regimens at JHBMC are likely effective for preventing such admissions. There were fewer patients meeting inclusion criteria than expected. This small sample size contributed to lack of accrual into the comparator cohort to evaluate risk factors between the two cohorts. Future investigations could include broadening inclusion criteria to other cancers treated with MEC and endpoints that describe the ability to capture uncontrolled CINV before it becomes severe enough to warrant an inpatient admission. Updated consensus guidelines published by the National Comprehensive Cancer Network in March 2017 now place carboplatin at AUC greater than or equal to four in the high-emetic risk category. Although the results of this study do not demonstrate need for additional CINV prophylaxis for carboplatin-containing regimens dosed at AUC five or six, these national consensus guidelines will be used to evaluate potential updates to carboplatin-containing chemotherapy antiemetic regimens.