Abstract Booklet
Regional Medical Education Conference

Hosted by: The Student Medical National Association Chapter of Case Western Reserve University School of Medicine

September 30th- October 2nd
The Research Forum of 2022 Region V Regional Medical Education Conference committee would like to thank all of our judges for their generosity in critically reviewing this year’s research posters and for their dedication to promoting scientific inquiry among Student National Medical Association members.
Meet Our Judges

Karen Ashby, MD

Dr. Ashby is a OB/GYN affiliated with University Hospitals. She completed her medical education at Case Western Reserve University School of Medicine. She completed her residency at Mt. Sinai Medical Center.
Dr. Modlin is a urologist affiliated with MetroHealth Hospital System. He received his medical degree from Northwestern University Medical School. He then completed his residency in urology at NYU. He completed a fellowship at the Cleveland Clinic Foundation in Renal Transplantation.
Dr. Jeanne Nwagwu is a PGY-1 OBGYN resident at Summa Health in Akron, OH. She attended Edward Via College of Osteopathic Medicine for medical school. While at VCOM, Dr. Nwagwu served SNMA in a variety of ways. Most notably, she is the former Regional Director for Region 6. Dr. Nwagwu enjoys mentorship and assisting premed students on their journey to becoming a physician. She is also passionate about serving and advocating for marginalized communities and women of color.
Ayanna Smith, MD MPH is a third year Obstetrics and Gynecology resident physician with a focused interest on marginalized communities, community-based public health initiatives, and improvement of healthcare procedure with regard to vulnerable patient populations. Dr. Smith was raised in the greater Cleveland and is dedicated to serving locally following training.
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Abstract Classification Explanation

Public Health, Health Policy, and Health Systems
These abstracts relate to public health studies, quality control, and macro-level healthcare. They also may address health disparities on a macro-level.

Clinical and Translational
This research emphasized investigations that relate to clinical practice or a segway between basic science research and the clinic. It often includes information obtained through chart reviews.

Medical Education
This category emphasizes research within academia and innovative approaches to improving education with the medical community.

Case Studies
This category provides room to highlight rare clinical presentations or conditions.

Basic Science
This category emphasizes the “benchwork” research that was performed. It may include cell culturing, animal models, or other such techniques.
Burden of Lower Limb Deformities in Resource Limited Countries

Lead Presenter: Kehinde S. Agoro

Additional Presenters: N/A

Co-Authors: Rachel L. Montoya MSc, Sanjeev Sabharwal, MD, MPH, Coleen S. Sabatini, MD, MPH

Title: Burden of Lower Limb Deformities in Resource Limited Countries

Introduction: Compared to high-income countries (HICs), low-income countries (LICs) and lower-middle-income countries (LMICs) have an uncharacterized prevalence of lower limb deformities (LLD) with an incongruent level of research and financial resources to meet their needs. Our current understanding of the prevalence of LLD from congenital, traumatic, infectious, oncologic, developmental, and nutritional etiology is limited to literature originating from HICs focusing on a specific source of deformity. We aim to review the evidence on the burden of LLD in LICs/LMICs through a scoping review.

Methods: PubMed, Embase, and Web of Science were searched via terms capturing the epidemiology of LLD in LICs/LMICs. The countries are classified based on gross national income (GNI) according to the World Bank Atlas method. After duplicate search results were removed, we completed title/abstract screening of 3,291 articles. Of these articles, 121 met inclusion criteria and progressed to full text screening. 53 studies were included for data extraction. Reports will be categorized by country, etiology of LLD, diagnosis, treatment, and the methodology of describing economic burden of disease.

Results: Preliminary data indicate an incidence of LLD related to infectious etiology, traumatic injuries, amputations from war, work related injuries, road traffic accidents, and complications from seeking alternative treatment interventions.

Conclusion: Presently, results indicate a dearth of fragmented data, reporting on one source of deformity in specific regions or hospitals within LICs/LMICs. Scarcity of data reflects social and historical resource inequalities and research priorities that favor epidemiological data in western nations. Insights gathered in this study will help us get a better sense of how the burden of LLD in resource limited countries further affect the economy, ability to receive adequate care and an improved quality of life. We will then be able to make steps towards appropriately prioritizing addressing needs through resource allocation, policy recommendations and future research.
Incorporation of Wellness, Diversity, Equity, and Inclusion in Anesthesiology Residency Websites

Lead Presenter: Emilie Garcia,

Additional Presenters: N/A

Co-Authors: Ganiru Anunike, Tonya Armes, Tanaya Sparkle, M.B.B.S, Kimberly Jenkins, M.D., Dani Zoorob, M.D., MBA

Objective: The objective of this study is to analyze the extent of integration of wellness, diversity, equity, and inclusion (DEI) concepts throughout the United States Anesthesiology residency programs.

Introduction: The internet has become a prime source for medical students to develop first impressions on prospective residency programs, especially with the transition to virtual interviews promoted by the pandemic. As such, institutional websites assist in delineating the program attributes which align with an individual’s needs, values, and beliefs.

Critical compatibility concepts include wellness, diversity, equity, and inclusion (DEI). Websites that lack citing such concepts may appeal less to potential trainees who value personal wellbeing and life-work balance – two critical concepts in today’s culture.

Methods: This is a cross-sectional study of websites of ACGME-approved Anesthesiology residency programs between 2021-2022. The assessment utilized 22-attributes with concentrations in wellness verbiage, gender and URIM (underrepresented in medicine), assessment of faculty and residents, and DEI-related semantics. Website photos were used to assess for racial/gender representation. These attributes were devised by two coordinated focus groups consisting of 49 racially, ethnically, and gender-diverse medical students from a large midwestern medical school.

Results: Of the 166 Anesthesiology residency programs in the United States, 158 (95%) had websites accessible for analysis, with eight programs lacking an online presence.

Concerning DEI, 25% had a dedicated section within their website, with 16% mentioning it in their mission statement. Supporting verbiage was present in up to 85% of the chairperson or program director’s letters or videos. Faculty and resident racial diversity were noted in 62% and 65% of websites displaying photographs, respectively, with 14% of programs integrating a DEI officer position to promote departmental diversity - held by faculty or residents.

Only 5% of programs displaying published research had projects focused on DEI, and 4% listed integrating it in their curriculum. Additionally, only 26% included such verbiage in their mission statements or program goals, with less than 4% mentioning faculty and resident microaggression and implicit bias training to help support such a focus. Support for religious and cultural needs of trainees was noted in 2% of websites only.
Gender diversity was noted in 90% of faculty members and 92% of the resident population. Merely 9% of websites had statements addressing sexual orientation and supporting LGBTQIA2S+ allyship, while only 4% had inclusive pronouns.

Regarding wellness, 7% of programs mentioned it in the program leadership’s letter and 77% in the website videos. However, only 12% of programs reported having dedicated wellness officers who focus on departmental wellbeing. Additionally, only 21% incorporated resident group wellness activities within the curriculum.

**Conclusion:** Anesthesiology residency websites nationwide may benefit from augmenting their reported support of DEI and wellness. Addressing this is vital to recruiting more compatible and diverse prospective trainees.
Creating a Culturally Competent Physician Force: A Student-Led Lecture to Move the Conversation Beyond Race and Skin Color

Lead Presenter: Megan Sharpe BS,

Additional Presenters: N/A

Co- Authors: MA, Kaelynn Workman BS, Amelia Clarke BA, Ashley Cantu-Weinstein BA, Penelope N. Halkiadakis BS, Adam Perzynski, PhD, MA, BA

Background: Medical schools and residency programs nationwide have started creating curricula for their learners that focus on structural competency, beyond race alone, to better prepare future clinicians to address these disparities and the role structural racism plays in poorer healthcare outcomes for minority patients. We sought to create the first structural competency lecture at Case Western Reserve University School of Medicine and analyze its impact on learners.

Methods: Students at our institution identified a gap in our education surrounding structural competency. We chose to focus on four upstream structural forces: environment, education, economics, and medicine. After examining the historical and contemporary context surrounding the issues that contribute to health inequities, including the criminal justice system, political policy, and redlining; we partnered with CWRU faculty to create and present the lecture as part of the preclinical curriculum. An optional post-lecture survey was distributed for evaluation.

Results: A total of 11 post-lecture survey responses were received. When asked about confidence in explaining structural barriers present in racial and ethnic minority communities, 100% of respondents responded with “agree” or “strongly agree”. However, 27.3% were either neutral or disagreed with the statement “I feel confident I can define structural competency”. Surprisingly, 9.1% believe race-based correction factors are justified in their use in medicine.

Conclusions: The variations in confidence of survey takers surrounding discussion and identification shows the importance of structural competency education. No medical curriculum should be considered comprehensive if it does not include education on the upstream structural forces that create and perpetuate health disparities. Our study is limited by the small number of respondents. In the future, we will work to refine our lecture and elicit more survey participation. Further work is needed to ensure cultural competency training is longitudinal in our curriculum and; ultimately; normalized within medicine.
Including Doulas in the Conversation: A Community-Based Participatory Research Study to Educate and Empower Doulas with Clinical Knowledge

Lead Presenter: Megan Sharpe, MA

Additional Presenters: N/A

Co-Authors: Rebekah Russell, MPH, Hannah Clarke, MPH, Chidera Nosiri, Krista Lumpkins

Purpose: Black maternal health disparities in the US continue to occur at unacceptably high rates. Our purpose in conducting this project was to work with our community partner, a local community-based doula program, to create a short lecture series for new doula trainees as an introduction to some of the medical aspects of birth. We aimed to help empower doulas and increase comfort level in communicating with healthcare providers and their patients on these topics.

Methods: In accordance with community-based participatory research (CBPR), we partnered with Birthing Beautiful Communities (BBC) to create a short lecture series covering the medical aspects of labor and delivery. A committee of medical students and doula trainers brainstormed potential topics to present to the most recent class of doula trainees.

Results: The final list of topics included “medical interventions during labor,” “postpartum changes,” “breastfeeding practices,” and “vaccinations during pregnancy.” Medical students worked with licensed physicians to include evidence-based information in each presentation. Each 45-minute lecture was given virtually with 15 minutes for questions and discussion.

Conclusions/Future Directions: In working with our community partner to assess the effectiveness of our lecture series, we found that many doulas gave positive verbal feedback to trainers at BBC. Our pre- and post-lecture survey results demonstrated increased levels of awareness and comfort surrounding each topic. Future CBPR should center the doula perspective in delineating ways to strengthen the comfort level of doulas during the labor and delivery process. This is especially important when we consider that the practice of doulas has been shown to decrease adverse events and unnecessary interventions during labor. We believe this work is an innovative approach that joins the movement to address the pervasive crisis of Black maternal healthcare in this country.
Improving Health Professional Students’ Attitudes and Empathy towards Diabetes

Lead Presenter: Re'Aija Grice

Additional Presenters: N/A.

Co-Authors: Elizabeth Beverley, PhD

Purpose: Research documents an association between healthcare providers’ negative attitudes toward diabetes and decreased self-care behaviors. People with diabetes who perceive negative attitudes from their healthcare providers are at increased risk for psychological distress and lower quality of life. Thus, training to address attitudes toward diabetes is essential. Moreover, training to address negative attitudes among health professional students is critical considering they will be the future generation treating people with diabetes.

Methods: Health professional students at a large Midwestern university were invited to participate in a cinematic virtual reality (VR) training in diabetes. The training program included 12 simulations that focused on a 72-year-old woman with type 2 diabetes living in rural Ohio. Participants observed interactions with the main character and her primary care physician, pharmacist, family, and community. Participants completed the Diabetes Attitude Scale-3 and the Jefferson Scale of Empathy before and after the training. We conducted paired t-tests to assess changes in attitudes and empathy.

Results: A total of 115 health professional students completed the VR training (mean age=22.0±3.7 years, 82.6% women, 5.2% Black, 8.7% Asian, 3.5% Hispanic/Latino, 24.3% medical students). Overall, participants showed improvements in all five subscales of the Diabetes Attitude Scale-3: “Need for special training” (mean change= -.21, t-value= -6.154, p<.001); “Seriousness of type 2 diabetes” (mean change= -.24, p<.001); “Value of tight glucose control” (mean change= -.15, p<.001); “Psychosocial impact of diabetes” (mean change= -.37, p<.001); and “Attitude toward patient autonomy” (mean change= -.16, p <.001). In addition, participants showed significant improvements in empathy scores post-training (mean change=5.7, p<.001).

Conclusions: Findings from this study suggest that cinematic VR training in diabetes improves attitudes and increases empathy toward diabetes. Additional research is needed to confirm these findings with a larger, more diverse sample.
Ideal cardiovascular health is associated with lower rates of colorectal cancer screening in African American men

Lead Presenter: Kasey Hornbuckle

Additional Presenters: N/A

Co-Authors: Amaris Williams, PhD; Joshua J. Joseph, MD, MPH; Aldenise P. Ewing, PhD, MPH, CPH

Background: African American men have some of the highest risks of death from cardiovascular disease (CVD) and colorectal cancer (CRC), amongst all groups. The American Heart Association’s (AHA) Life's Simple 7 (LS7) cardiovascular health (CVH) scores provide assessment of CVD-related risk factors, which are co-related to CRC. Studies have yet to examine the association of CVH scores and CRC screening history as a proxy for CRC risk among African American men.

Methods: African American men, ages 45-75, participated in one of three annual, community-based health screenings in 2018, 2019 and 2021 and screened for 6 of the LS7 measures of CVH (smoking, physical activity, body mass index, blood pressure, cholesterol, and glucose, [LS6]). The association of LS6 scale scores and self-reported CRC screening were assessed using logistic regression modeling with continuous or categorical LS6 and sequentially added covariates (age, year of walk, education, income, and insurance).

Results: A total of 680 African American men with a mean age of 57.2 years (SD = 7.5) participated in this study with poor (23%), intermediate (55%), or ideal (22%) LS6 scores. For every 1-point increase in LS6 scores (0-6) in the fully adjusted model, there was a 26% lower odds of reported CRC screening (P = 0.001). African American men with ideal LS6 scores, in the fully adjusted model, had 60% lower odds of CRC screening compared to men with poor LS6 scores (p<0.001). Men reporting vs. not reporting CRC screening were more likely to report the use of blood pressure (46% vs. 32%; p=0.003) and cholesterol medications (27% vs. 14%; p<0.001).

Discussion/Conclusions: African American men with higher CVH scores have lower odds of colorectal cancer screening. Interventions are needed to educate African American men with high CVH about the importance of CRC screening to reduce the risk of adverse CRC-related outcomes.
Traction Alopecia and CCCA: Literature Review and Recommendations

Lead Presenter: Shanelle Jackson B.S.

Additional Presenters: N/A

Co-Authors: Kourtney Pony B.A., Lauren Seale M.D.

Purpose/Goal (Background): Hair loss is a common concern among women who use high-tension hairstyles. Common alopecia’s that are affected by continuous high-tension hairstyles include traction alopecia (TA) and central centrifugal cicatricial alopecia (CCCA). TA causes marked hair loss in areas of high mechanical stress, creating chronic traction resulting in damage to terminal hairs with preserved vellus hairs. In late TA, terminal hairs are replaced by fibrotic fibrous tracts. The pathogenesis of CCCA was initially believed to be primarily due to hairstyling, but recent research has shown it is multifactorial.

Given the significance of hairstyling in the management of TA and CCCA, it is imperative that providers are aware of the styles to recommend to patients affected by these conditions. We conducted a literature review of scholarly articles on TA and CCCA that specifically mentioned specific styles for patients affected by these conditions.

Methods: In November 2021, a literature review was conducted by use of PubMed using the search criteria ["Traction Alopecia" OR "Traction AND Alopecia"] for articles related to TA, and ["Central Centrifugal Cicatricial Alopecia" OR "CCCA"]. Articles were excluded if the full-text article could not be obtained.

Results: The search criteria for TA produced 135 results. Of the results, 4 mentioned specific styling techniques.
When using the search criteria for CCCA, we found 402 results. Of these, only 1 mentioned specific styling techniques.

Conclusion: Few articles provided specific styling suggestions, limiting providers’ ability to counsel patients if they do not have firsthand experience on how to style tightly coiled hair. We will provide a general list of recommendations to prevent worsening of hair loss. These guidelines may help produce improved outcomes for patients affected by TA and CCCA."
COVID-19 Vaccine Inequity In St. Louis

Lead Presenters: Adjoa Cofie

Additional Presenters: N/A

Co-Authors: Hassiet Asberom, Jeannine Viruet

Background: COVID-19 has disproportionately impacted marginalized communities of color in North County St. Louis, making it critical to identify predictors and factors associated with the COVID-19 vaccination status. This research aims to quantify vaccination rates within school districts in North County, identify characteristics and predictors associated with vaccination status, and understand common perspectives and barriers regarding COVID-19 vaccinations.

Methods: Data from “Assessing COVID-19 Testing Strategies in K-12 Schools in Underserved Populations” was used in this study. We used descriptive statistics: $\chi^2$ tests and a logistic regression model to compare participant characteristics between vaccinated and unvaccinated individuals and identify predictors respectively. Thematic analysis was utilized to determine recurring reasons amongst unvaccinated individuals.

Results: From the original study, 1,118 individuals, ages 5-85, were screened for inclusion. Across the schools, 70.8% were vaccinated. There was a significant association between school affiliation and vaccination rate, race and vaccination rate, age and vaccination rate, and home address and vaccination status. Significant positive predictors for being vaccinated for COVID-19 were—a home address in the western region of St. Louis, a home address outside of St. Louis County, and older age. Significant negative predictors included identifying as Black, identifying as other race, and preferring not to answer race identification. Concerns determined from unvaccinated participants include freedom of choice, distrust in the health system, concern for safety and health, and divisions within families.

Conclusion: School affiliation, race, ethnicity, sex assigned by birth, and age were associated with vaccination rates. It was also found that those who identified as Black were 87% less likely to be vaccinated than individuals who identified as white. Our findings mirror St. Louis's long history of racial injustice and highlight the demographics and social determinants that impact health disparities regarding COVID-19 in the St. Louis County communities.
Exploring Factors Associated with Post-Natal Care Non-Compliance Among Low Birth Weight and Premature Infants in Ghana

Lead Presenter: Aceil Shamieh

Additional Presenters: N/A

Co-Authors: Y.A. Civil, MD, MPH; T. Hart-Johnson, MS; A. Bakari, MD; A. Campbell, MD; R.A. Blackwood, MD, PhD

Background: Ghana suffers one of the highest rates of infant mortality globally, at 33 deaths per 1,000 live births annually. Studies show that premature and low-birth weight (LBW) infants are at higher risk for mortality due to birth complications and preventable ailments. Reducing infant mortality rates is a central global health goal, however, medical attention focuses on immediate rather than long-term survival through routine post-natal care (PNC). PNC has been shown to significantly reduce infant mortality. Few studies have analyzed the effects of factors and perceptions on patient non-compliance to PNC in Ghana. This study aims to investigate which factors are associated with higher rates of non-compliance to post-natal care amongst the premature and LBW population in Ghana.

Methods: This retrospective cohort study dated from 2018-2020 is composed of 478 premature and LBW infants born in two hospitals in Kumasi, Ghana. A sociodemographic questionnaire and infant feeding survey were given to mothers upon every PNC visit. Data was analyzed on IBM SPSS through crosstabs with chi-square statistics and binary logistic regression.

Results: Findings showed higher rates of noncompliance among younger mothers, mothers who perceived their infant to not eat enough and to physically be “too small”, along with not using private vehicles to the PNC visit. Conclusion: This study analyzed several sociodemographic barriers in ensuring equitable PNC care to infants in Ghana. Through determining said barriers, healthcare workers can make a more concerted effort of establishing wider public health campaigns to reach the Sustainable Development Goal (SDG)-3 of reducing both neonatal and under-five mortality in this region.
Implementation of Remote Patient Monitoring for Transitional Care of Post Operative Patients Improves Health Outcomes

Lead Presenter: Olatunde Bashorun Jr.

Additional Presenters: N/A

Co-Authors: Maurice Hinson, MD

Purpose/Goal: To perform a systematic review to examine 30-day readmission rates, morbidity/mortality, and quality of life metrics in order to determine efficacy and cost-effectiveness associated with implementation of remote patient monitoring (RPM) in post-surgical patients compared to standard of care.

Description: Fragmented care, especially in the immediate post-discharge transition of surgical patients, has posed a tremendous burden on the overall health and quality of life of patients, as well as on the financial commitment of hospital systems. While COVID-19 posed a challenge for healthcare systems, medical doctors, and surgeons worldwide, it has resulted in the emergence of widespread use of telehealth and other virtual care modalities. However, there is a paucity of studies evaluating the overall impact of remote patient monitoring on readmission rates, medication adherence, morbidity/mortality, quality of life, and cost savings in post-surgical patients.

Methods: A Medline(PubMed) database search was conducted to identify studies published between January 2019 to September 2022. Search term strategy was: (((remote monitoring) OR (telehealth)) OR (virtual)) AND (post surgery)) AND (mortality) Filters: from 2019 – 2022. Remote patient monitoring was defined as was defined as any smartphone, tablet, computer capable, or other electronic device capable of capturing health-related patient information and transmitting data to a clinical provider. For an article to be included, it had to discuss how remote patient monitoring affected management and outcomes of patients who recently underwent surgery. Outcomes mentioned that met inclusion criteria were mortality, morbidity, medication adherence, and overall patient satisfaction.

Results: 7 articles met inclusion criteria. With the exception of one article, all articles reported positive outcomes increased detection of drug error, drug compliance, cost-savings on transportation, significantly lower readmission rates in telemedicine groups, similar 1-90-day mortality rates, similar morbidity rates, overall decreased exposure to COVID-19, and how of implementation virtual platforms in healthcare augment the experience for both the patient and provider.

Conclusion/Future Directions: To create and implement a primary care physician group-led remote patient monitoring program to optimize transitional care of post-operative patients, as well as investigating logistical processes for providing adequate resources for patient post-op management education and wound care.
Differences in cardiac MRI T1 with rapid-sequence scan protocolling

Lead Presenter: Seth Garrett

Additional Presenters: N/A

Background: T1 and T2-weighted images in cardiac magnetic resonance (CMR) imaging are useful for analysis of a variety of pathologies. Current CMR protocols stack image acquisitions with a rest interval in between for allowance of proton relaxation in between scans. Great interest currently exists in shortening the total time of the CMR scan outside of non-compressible time wherever possible. Less explored are the actual changes in measured T1 and T2 values that result from scans completed without rest intervals in between. The aim of this study is to measure the differences in T1 and T2 values with various pulse sequences when scans are taken immediately following one another to identify any possible differences.

Methods: Five volunteers were scanned using a Siemens Healthineers 1.5T MRI scanner in the course of the study whose data has been de-identified. To prepare for the acquisition of the images of interest, several preparatory scans were taken and the short axis was defined.

For T1 images, a modified Look-Locker inversion (MOLLI) 3-slice scan was collected with a 30-second rest interval immediately following. Then, a MOLLI 3-slice scan was taken immediately followed by another MOLLI 3-slice scan without the 30-second rest interval in between. There was a 30-second rest interval following these two consecutive scans. Finally, a cine short axis scan was followed immediately by another MOLLI 3-slice scan without a 30-second rest interval in between those two scans. A 30-second rest interval was taken. For each volunteer, this process was repeated using the balanced steady-state free procession (bSSFP) pulse sequence for collection of T2 images. Following the MOLLI and bSSFP pulse sequence scans, Cardiac MR fingerprinting (MRF) scans were taken for acquisition of T1 and T2 images from the same scan.

All images analyzed were taken in the short-axis view and contrast-adjusted. The software ITK-SNAP was used to segment regions of interest and calculate the mean T1 and T2 values within the ROIs. Short-axis views of the myocardium were segmented using the AHA 17-segment model based on the basal, mid, or apical location. The mean T1 and T2 values for each myocardial segment were analyzed and compared from pre- to post- non-rest interval scan.

Results: The mean T1 and T2 parameters were calculated for each respective pulse sequence and the differences between the pre- and post- non-rest interval scans were determined. Both calculated T1 parameters decreased while T2 decreased for the MRF sequence but increased with the bSSFP sequence.

Pulse sequence, parameter
Difference with non-rest interval scans
MOLLI, T1    -1.166
bSSFP, T2    +0.688
MRF, T1      -1.91068125
MRF, T2      -1.00520125

A one-sample t-test testing for a difference in parameters before and after non-rest interval scans was performed. There was no significant difference between pre- and post- non-rest interval scans for any pulse sequence performed.

<table>
<thead>
<tr>
<th>Pulse sequence, parameter</th>
<th>P-value ($\alpha = 0.05$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOLLI, T1</td>
<td>0.899</td>
</tr>
<tr>
<td>bSSFP, T2</td>
<td>0.760</td>
</tr>
<tr>
<td>MRF, T1</td>
<td>0.862</td>
</tr>
<tr>
<td>MRF, T2</td>
<td><strong>0.542</strong></td>
</tr>
</tbody>
</table>

**Conclusions:** Overall, mean T1 decreased when rest intervals were not taken, however, the differences were not statistically significant. This effect was most pronounced in T2 MRF where all mean T2 values decreased by the greatest margin. This suggests that while there is a slight decrease in MOLLI and MRF T1 values and MRF T2 values and increase in bSSFP T2 values, the result of not protocolling a full 30-second rest sequence is of little consequence to measured parameters. Future studies should investigate the clinical relevance of rapid-sequence scanning.
Complications Related to Prolonged Use of Steroids Among Children With Uveitis: A retrospective study.

Lead Presenters: Cameron Edwards

Additional Presenters: N/A

Co-Authors: Paul Smith, Nicole M. Taylor, Stacey E. Tarvin, and Martha Rodriguez

"Background: Uveitis can be described as inflammation of the eye. It is classified depending on the location of the inflammation in anterior, intermediate, posterior and panuveitis. The current guidelines for first-line treatment include glucocorticoids, topical with eyedrops, intraocular corticosteroid injections and systemic (oral). Potential complications of patients on prolonged topical steroids include, glaucoma, and cataracts, which can subsequently cause permanent visual loss. The aim of this study is to describe the complications related to the use of prolonged topical steroids among pediatric uveitis patients.

Methods: This retrospective observational study reviewed the medical records of children (age ≤ 18 years) with uveitis at Riley Hospital for Children between 1997-2022 data collected included age at onset of uveitis, sex, anatomic location of ocular inflammation, comorbid disease (including systemic inflammatory disease), ocular complications, relevant laboratory data, and treatment. Study data was collected and managed using REDCap. Statistical analysis was performed using SPSS software.

Results: Out of 122 subjects, anterior uveitis constituted 45.1% of patients, intermediate 15.6% and posterior uveitis 0.8%. The median age of diagnosis was 10 years of age and 53.3% were female. Among these 54.1% of patients were placed on steroids, of which 49.2% were on topical steroids drops and 5.7% on oral steroids. Within the group of patients on chronic steroids 18% developed cataracts and 8.2% subsequently required corrective surgery, 10.7% developed glaucoma and 13.9% required intraocular pressure reducing drops.

Conclusion and Potential Impact: Uveitis treatment can be challenging, and some patients require longer periods of topical steroid use, which can be associated with complications including glaucoma and cataracts which can lead to blindness. In this cohort 18% developed cataracts and 10.7% developed glaucoma. These effects can be mitigated with attentive monitoring. Balancing the benefits and risks of steroids and judicious use are vital to optimizing ocular health.
Quality, safety, and cost of flexible nailing vs. closed reduction in adolescent diaphyseal tibia fractures

Lead Presenter: Madeline Foo

Additional Presenters: N/A

Co-Authors: Talaijha Haynes, MS, Julie Balch Samora, MD, PhD, MPH

Objective: Tibial shaft fractures are common pediatric injuries. Despite their high incidence and recent literature advocating for early surgical stabilization, the optimal treatment is still unclear. This study aimed to compare the outcomes and cost of closed isolated tibial shaft fractures in pediatric patients initially treated with Closed Reduction and casting (CR) to those initially treated with Elastic Stable Intramedullary Nailing (ESIN).

Methods: A retrospective review was performed of 6-to-16-year-olds who sustained an isolated tibial diaphyseal fracture and initially underwent CR or ESIN between 2016 and 2021. CPT codes 27759 and 27752 were utilized. Exclusion criteria included skeletally mature individuals, open fractures, non-diaphyseal tibial fractures, intra-articular fracture extension to knee or ankle joint, bilateral injury, and polytrauma.

Patient demographics, injury pattern, radiographic impressions, treatment, and charge data were recorded. Outcome measures included additional interventions (both nonsurgical and surgical), length of immobilization, time to partial and full weight bearing, number of radiographs obtained during treatment, number of orthopaedic clinic visits, and complications.

Results: One hundred patients were identified, and 30 satisfied the inclusion criteria: patients initially treated with CR (n=24) and those initially treated with ESIN (n=6). In the CR group, 19 of 24 patients failed nonoperative management and required surgical intervention (median time to second treatment 15.00 days, IQR = 10.00), and 11 of 19 (57.9%) underwent hardware removal. In the ESIN group, no patients required additional treatment and no complications were noted; 3 of 6 (50%) patients elected to have their implant removed.

Significant differences for CR and ESIN groups included age at initial treatment (13.44 vs 11.63, p= 0.034) and total number of follow-up visits (9.17 vs 4.83, p = 0.008).

The total average clinical, imaging, and hospital charge results are forthcoming.

Conclusions: Previous literature focused on the financial analysis of CR vs. ESIN report that the highest charges are associated with patients that failed nonoperative care and required surgery. In our study, 79% of CR patients required surgical intervention, suggesting they will incur a greater financial and personal burden. Although it is common practice to pursue the least invasive option as first line treatment, perhaps immediate ESIN for tibial shaft fractures in older children is a better option than an initial attempt at closed management.
Outcomes of Phalangeal Neck Fractures in Children with Medicaid vs. Private Insurance

Lead Presenter: Madeline Foo

Additional Presenters: Talaijha Haynes

Co-Authors: Julie Balch Samora, MD, PhD, MPH, Kirsten Tulchin-Francis, PhD

Objective:
It has been well documented that insurance status contributes to health disparities and access to patient care. Assessment of treatment plans and cost of medical care in specific populations and medical emergencies is necessary to understand better how outcomes differ and ultimately determine how health care disparities can be minimized. This study assessed the role of insurance status in treatment outcomes in pediatric phalangeal neck fractures (PNF). We hypothesized that, while provided medical treatment would be similar, the clinical outcomes of treatment would vary based on insurance type.

Methods:
A retrospective chart review was conducted on pediatric patients who sustained phalangeal neck fractures at a single institution between January 2015 and January 2021. These patients were treated via closed reduction percutaneous pinning (CRPP) by fellowship-trained hand surgeons. Exclusion criteria includes patients with inadequate records and those above eighteen. Data collection included treatment plans, treatment adherence, long-term outcomes, and insurance status. A voluntary follow-up outcomes questionnaire will be conducted, via phone, following the chart review.

Results:
Information forthcoming pending completion.

Conclusions: This novel study will provide new information on the correlation of insurance status and outcomes in phalangeal neck fractures in pediatric patients. These findings can be used to systematically improve the quality of patient care in hopes of diminishing any disparities or discrepancies in treatment outcomes.
Comparison of Quantitative and Qualitative Shoulder Range of Motion with Patient Reported Outcomes

Lead Presenter: Jonathan Harley

Additional Presenters: N/A

Co-Authors: Brian Grawe M.D, Orthopedic Surgery (PI); Brian Johnson M.D., John Bonamer MS4; Zach Crawford M.D, Orthopedic Surgery

Background: The evaluation of shoulder function requires a combination of physical examination of shoulder range of motion and measures of functional outcomes. Though efforts have been made to define range of motion for clinical evaluation with respect to functional outcomes, a disconnect still exists when defining a successful outcome. We aim to compare quantitative and qualitative measures of shoulder range of motion with patient reported outcome measures.

Methods: 100 patients presenting to the office of a single surgeon with a chief complaint of shoulder pain were evaluated for this study. Evaluation included American Shoulder and Elbow Surgeons Standardized Shoulder Form (ASES), Single Assessment Numeric Evaluation (SANE) relative to the shoulder of interest, anonymous demographic information, and an evaluation of range of motion in the shoulder of interest. Hand-behind-back reach to defined anatomical landmarks was used to qualitatively assess internal rotation.

Results: Internal rotation angle did not correlate with patient reported outcomes, while external rotation and forward flexion did. Qualitative internal rotation demonstrated a weak to moderate correlation with patient reported outcomes and a significant difference in global range of motion and functional outcome measures were identified in patients who can or cannot reach above the belt line or to the thoracic spine. Qualitative assessment of forward flexion demonstrated that patients who can reach specific anatomical landmarks have significantly improved functional outcome measures, and the same is true when comparing patients that can externally rotate past neutral.

Conclusion: Hand-behind-back reach can be used as a clinical marker of global range of motion and functional outcome measures for patients with shoulder pain. Goniometer measurement of internal rotation has no relationship with patient reported outcomes. Forward flexion and external rotation assessment with qualitative cutoffs can additionally be used clinically to determine functional outcome for patients with shoulder pain.
Caderas y Rollidas: Quality of Spanish Language Orthopedic Patient Education Material

Lead Presenter: Ramón A. Arza

Additional Presenters: N/A

Co-Authors: Ajay S. Potluri, Amanda Avila, Emilio Grau, Alex Acuna, Atul F. Kamath, MD

Background: Online educational materials are an essential source of information for patients interested in learning about their healthcare. Limited information exists regarding the quality and readability of online Spanish patient education material (PEM) about knee and hip arthroplasty. The study’s objective is to assess the quality and readability of online resources related to two of the most common orthopedic surgeries.

Methods: Online Spanish PEMs were gathered using Google and Bing. PEMs were collected using the search terms ""reemplazo de cadera"" and ""reemplazo de rodilla."" The first page and top 5 results of the second page were used to collect parent articles and those found within one 1-click of the parent source. Only articles about hip and knee arthroplasty were included in the present study. The Índice Flesch-Szigriszt (INFLESZ) and Fernández-Huerta were used to assess readability. Quality Criteria (GQC) and QUality Evaluation Scoring Tool (QUEST) were used to determine quality. Additionally, sources were grouped into authoritative (i.e., academic hospitals, journals, or government websites) and non-authoritative. Finally, the Mann-Whitney U test was used to compare the means.

Results: A total of 101 THA and TKA Spanish language PEMs from 28 sources were analyzed. The average Fernández-Huerta and INFLESZ scores were 56.96±5.95 and 61.56±5, respectively. Academic sources had higher QUEST, and GQC scores, +6.00 (p = <.001, CI: 3.00-7.00) and +1.00 (p = 0.13, CI: -0.00-1.00), respectively. Additionally, authoritative sources had higher scores for readability methodologies, of which Fernández-Huerta was statistically significant (p = .047).

Conclusion: The mean INFLEZ score equates to a 10-12th grade level, while the Fernández-Huerta corresponds to an 8/9th grade level. Given that the American Medical Association recommends educational material written below the 6th-grade level, these findings suggest a mismatch between PEMs and their audience. Furthermore, our data indicate that authoritative sources are optimally equipped to provide high-quality PEMs.
**Feasibility and Performance of Procalcitonin Guided Antimicrobial Stewardship During Autologous Stem Cell Transplantation**

**Lead Presenter:** William Clark

**Additional Presenters:** N/A

**Co-Authors:** Anupam Pande, MD, MPH, Sandra Susanibar Adaniya, MD, Rachel Wilkinson, Monica Grazziutti, MD, Senu Apewokin, MD

**Purpose/Goal:** Antibiotic stewardship during stem cell transplantation (SCT) is challenging. Suboptimal diagnostics, atypical presentations of infections and poor outcomes encourage adoption of low thresholds for initiating empiric antimicrobials. Widely adopted triggers for initiating empiric antibiotics are poor indicators of infection in SCT patients, thus leading to inappropriate antibiotic utilization. Procalcitonin (PCT) has been employed successfully to guide antibiotic stewardship in critical care patients but has not been assessed in SCT recipients. We sought to evaluate the potential utility of PCT to guide antimicrobial de-escalation during SCT engraftment.

**Description:** 100 patients undergoing autologous SCT were prospectively enrolled in a “strategy trial” with infectious complications documented. Laboratory parameters (CBC, BMP, CRP) were obtained daily as standard-of-care while PCT was obtained for research only. Providers were blinded to PCT results. We compared duration of antimicrobial escalation between actual events (standard-of-care model) and a proposed PCT model. In the hypothetical PCT model, the antibiotic de-escalation occurred if CRP remains <100 mg/dl and PCT <0.25 ng/ml after 3 days of escalation. Escalation events were defined as a substitution or addition of an antibacterial agent after initiation of prophylactic antimicrobials.

**Outcomes:** 77 patients had escalation events; of these, 33 had bacterial infections. 136 antimicrobial escalations events were identified, of these, only 39 (28.7%) were associated with documented infections. The routine care model had a mean duration of 9.08±6.08 antibiotic days. If the PCT model were employed, the mean duration would be 4.44±6.16 days (p<0.001). The PCT model, however, would have missed 11 infections. Coagulase-negative staphylococcal (CONS) bacteremia and colitis (C. difficile and CMV) accounted for 73% of missed infections.

**Evaluation:** Procalcitonin guided antimicrobial stewardship during autologous SCT is feasible. However, clinicians must be cognizant of performance limitations in capturing infection. Furthermore, optimization is necessitated for utilization as a tool to guide antibiotic prophylaxis during SCT.
Periprosthetic and Interprosthetic Femur Fractures: Can We Do Better?

Lead Presenter: Jalen Warren

Additional Presenters: N/A

Co-Authors: Lisa K. Cannada, M.D

Introduction: The number of total knee arthroplasties (TKA) and total hip arthroplasties (THA) are expected to continue to rise with the aging population. A known complication is periprosthetic (PFF) and interprosthetic femur fractures (IFF) due to the poor bone quality and advanced age of these patients. In stable implants, these fractures are often treated with open reduction and internal fixation (ORIF), Intramedullary Nail (IMN), a combination of IMN/ORIF or distal femoral replacement (DFR) but there are limited outcome studies in the literature. Our aim is to investigate technique variations which may lead to the lowest complication rates in patients with these fractures.

Methods: A retrospective review was done examining the surgical stabilization and outcome of PFF and IFF at the Charlotte Orthopedic Hospital by Novant Orthopedic surgeons from 2018-2022. Demographic data and surgery details were obtained. Periprosthetic fractures treated with arthroplasty revision were excluded. Outcomes including complications, additional procedures and mortality rates were calculated.

Results: There were 30 PFF and 5 IFF in 34 patients. The average age was 76 y/o (range 50-93). Thirty patients were White, 3 Black, and 1 Hispanic. There were 19 distal femur PFF and 11 Vancouver C PFF. The average OR time was 104 minutes (range 39-210). 28/35 fractures were treated with plate fixation via ORIF, 4 with intramedullary nails (IMN), 2 underwent distal femur replacement (DFR) and 1 was treated with cerclage cables only. Out of the 34 patients, 4 patients underwent repeat operation (1-7 procedures). Three had deep infections and a nonunion, and 1 had evacuation of hematoma. Three underwent revision ORIF. There was a 12% mortality rate (4/34) at the latest follow up.

Discussion: Overall, we found 15% (4/27) of plate fixations required additional surgery due to a complication. Finding the best combination of stiffness to permit healing and recommendations on working length might be useful in future work. Our mortality rate was 12%. This is lower than the hip fracture mortality rate and is useful information for patients with these fractures when deciding their plan for treatment. When the surgical stabilization was completed by trauma surgeons, patients had both a decreased rate of repeat operation (7% vs. 38%) and a decreased average operation time (102 vs. 111 min) compared to when a total joint surgeon completed the procedure. This warrants evaluation with larger studies, including additional details related to the techniques of plate fixation which lead to decreased complication rates. Further investigation on fixation details and surgeon specialty training may highlight what treatment method provides patients the best outcomes.
Lead Presenter: Maleka Nozile

Additional Presenters: N/A

Co-Authors: LaMiah Hall, Amelia Jernigan MD, Tara Castellano MD, Navya Nair MD, Augusto Ochoa MD

Background: Clinical trials are imperative for the advancement of cancer care and outcomes. In this study, we aimed to identify variables associated with being offered a clinical trial.

Methods: A quality improvement initiative was aimed at identifying barriers to clinical trial availability from 01/03/2022 to 01/31/2022. A retrospective chart review was performed to evaluate how race, age, distance from hospitals, insurance status, and cancer variables affect gynecological oncology clinical trial availability. Fisher exact tests were used to compare categorical distributions across trial offering groups, while continuous covariates were summarized using a Wilcoxon rank-sum test.

Results: Of the 169 patient visits, significantly more patients were offered clinical trial enrollment at the University Medical Center-New Orleans (UMCNO) than at other locations (32% vs 13.6%, p-value=0.019). Of these patients, 49% of stage 1 patients were enrolled in a clinical trial, this is significantly higher than non-stage 1 patients (p-value<0.001). Notably, patients that were enrolled in a clinical trial were significantly younger and had lower platelet counts.

Conclusion: In this quality improvement study, we found that clinical site, stage of disease, age, and platelet counts were associated with clinical trial participation. By better understanding the barriers to trial enrollment, we aim to improve participation. Ultimately, more inclusive criteria can lead to advancements in clinical trial enrollment.
Frequency and Impact of Germline MUTYH mutations in Patients with Neuroendocrine Cancers (NEC)

Lead Presenter: Isaiah Boateng

Additional Presenters: N/A

Co-Authors: Ann-Kathrin Eisfeld

Background: NECs are highly aggressive malignancies. There is the clinical need to identify disease-predisposing genes to enable screening and early tumor detection. We utilized one of the largest cohorts of NEC patients to delineate the frequency of germline MUTYH mutation and their effects on the clinical and molecular characteristics.

Methods and Material: Our patient cohort comprised 680 adult patients that were enrolled into Total Cancer Care/ORIEN. For identification of potentially pathogenic germline variants in the whole exome sequencing data, only non-synonymous variants in protein coding genes, with variant allele fractions of ≥0.15 were considered. Tumors of patients identified to harbor germline MUTYH mutations were further characterized for functional mutation consequences via immunoblotting of MUTYH protein expression, H&E staining for MUTYH and associated DNA damage repair genes; as well as multiplex staining for immune activation.

Results: Pancreatic NECs were the most frequent tumor location (n=208), followed by the small intestine (n=179), lung (n=71), and other locations. In the germline whole exome sequencing data, we identified a total of 3411 variants, including n=65 predicted pathogenic variants. Notably, predicted pathogenic or potentially pathogenic germline variants in MUTYH were detected in 4.8% (7 out of 144) patients. The mutations were of the predicted pathogenic variants were found in 2 mutation hotspots. Patients with germline MUTYH mutations had lower MUTYH expression in RNAseq and immunoblot. However, interestingly, patients with p.Tyr151Cys had lower expression, indicating a deleterious effect.

Conclusion: Our study suggests a strikingly high incidence of germline MUTYH mutations in NECs. We speculate that these variants may contribute to NEC development. Further, we hypothesize that the MUTYH gene could be a new target for therapeutic interventions for the treatment of neuroendocrine tumors.
Evaluation and Impact of an Interdisciplinary Weight Management Clinic in the Primary Care Setting

Lead Presenter: Colin Wilson

Additional Presenters: N/A

Co-Authors: Megan Adelman PharmD, Chanda Mullen PhD, Mason Page MD

Background
The potential for improved disease state control with comprehensive interdisciplinary care has been documented within literature. However, literature on applying this approach to weight management remains limited. The objective of this study was to evaluate successful weight loss within a novel interdisciplinary clinic in the primary care setting.

Methods
This was a retrospective, single-center cohort study of adult Family Medicine patients with a body mass index (BMI) ≥ 27 kg/m², who completed at least one follow-up appointment with the weight management clinic that were consulted between September 1, 2020, and August 31, 2022. The weight management clinic team included one behaviorist, one remote dietitian, one pharmacist, and two championing physicians. The primary outcome of the study was weight change at 6 months following first appointment. Measurements for secondary outcomes included low density lipoprotein (LDL) and hemoglobin A1c (HbA1c) at 6 months.

Results
Overall, 33 patients were consulted, completed a follow-up appointment, and had data at the 6-month timepoint. This cohort had a mean age of 50 years (± 12), a mean baseline BMI of 43 kg/m² (± 9), a baseline median weight of 113 kg [96-133], was 85% female, 52% African American, and 49% Caucasian. Through the program, 88% met with a dietitian, and 79% were prescribed medication to assist in weight loss with Bupropion most commonly prescribed at 50%. At 6 months, there was an average weight loss of 5 kg (± 7) or 11 lbs., representing a 5% decrease in weight and an average reduction in BMI of 2.3 kg/m² [0.2-3.4], representing a 4.5% decrease BMI. Among secondary outcomes, there was a 0.6 [0-4.4] decrease in HbA1c (n=25) and a decrease of 5 ± 66 of LDL (n=16).

Conclusion
A comprehensive multidisciplinary approach to weight management in the primary care setting shows clinical benefits.
Characterization and Reach of Orthopaedic Research Posted to a Preprint Server: Are We ‘Undercooking’ Our Science?

Lead Presenter: Adam A. Rizk

Additional Presenters: Ramon A. Arza

Co-Authors: Tarun K. Jella, MPH, Thomas B. Cwalina, MBA, Thomas J. Pumo, MD, Atul F. Kamath, MD

Background:
Although the rapid growth of preprint servers over the last several years has been demonstrated, the reach of preprints related to orthopaedic surgery remains poorly understood. Our goal is to examine the number and characteristics of orthopedic articles found in medRxiv, and their public and academic engagement.

Methods:
The medRxiv online database was queried for all preprint studies published between July 8, 2019, and June 7, 2022, related to orthopaedic surgery. From our search, 177 unique preprints posted on medRxiv met the inclusion criteria and were further characterized in terms of the orthopaedic subspecialty, study design, date posted, and geographic factors. Academic and public engagement metrics were collected for each preprint and subsequent journal publication. Paired t-tests were conducted to compare engagement metrics.

Results:
Orthopaedic preprint activity increased 12-fold from 2 preprints in the third quarter of 2019 to 24 preprints in the first quarter of 2022. 94 of 177 orthopaedic preprint articles led to publication. Preprint articles received significantly more abstract views (P = 0.002) and PDF downloads (P = 0.001) when compared to published articles. The publications had significantly more citations (P = <0.001) and full-text views (P = <0.001) than the preprints. Published articles had significantly increased tweets (P = <0.001) and Altmetric scores (P = <0.001).

Conclusion:
Our findings suggest a growing number of orthopedic preprints and dissemination to an increasingly large public audience.
Prolapse-Associated Pain Improves with Surgical Treatment of Pelvic Organ Prolapse

Lead Presenter: Osedebamen Laura Aigbe

Additional Presenters: N/A

Co-Authors: Angela S Yuan, M.D., Amy D. Gee, M.D., Cecile A. Ferrando, M.D., M.P.H, Lisa C. Hickman, M.D.

Introduction: Pelvic organ prolapse (POP) presents with symptoms of vaginal pressure or fullness but has rarely been associated with pain. The characteristics of individuals reporting prolapse-related pain and the impact of POP surgery on these symptoms has not been well-defined. Objective: To define the incidence and characterize prolapse-related pain in patients presenting with POP, as well as determine the impact of surgery and factors associated with pain resolution postoperatively.

Methods: This is a retrospective cohort study of patients presenting for initial POP evaluation between 2019-2020 at CCF. Using a standardized questionnaire, patients were asked, “Do you have pain associated with your prolapse?” and to indicate the pain severity and location(s). Patients who underwent POP surgery were asked if their POP-related pain resolved. Clinical variables were extracted from the electronic medical record.

Results: 795 patients met inclusion criteria. POP-related pain was reported by 106 (13.3%) patients. Patients reporting POP-related pain were more likely to have undergone prior urogynecologic surgery (30 [28.3%] vs 129 [18.7%], p=.022), report sexual dysfunction (36 [69.2%] vs 160 [44.2%], p=.001) and dyspareunia (25 [48.1%] vs 90 [24.9%], p<.001), and have chronic pelvic pain (6 [5.7%] vs 12 [1.7%], p=.024) at baseline. No significant differences in POP-Q stage, prior hysterectomy, or sexual abuse history were found between patients with and without POP-related pain. 57 (53.8%) patients subsequently underwent surgery, and 40 (70.2%) reported that their POP-related pain resolved postoperatively. 10 (17.5%) reported their POP-related pain did not resolve.

Conclusions: Pain is a symptom experienced by more than 1 in 8 patients with POP. Nearly 4 out of 5 women with POP-related pain reported resolution after surgery. Baseline POP stage, pain severity, and surgical approach were not associated with pain resolution.
Clinical and Ophthalmic Biomarkers of Diabetes Mellitus: A Longitudinal Study of Visual Outcome

Lead Presenter: Fanny Huang

Additional Presenters: N/A

Co-Authors: Miaomiao Yu, Laura Huang, Gabriella Zhou, Ruikang Wang, Theodore Leng, Sophia Wang, Yaping Joyce Liao

Background:
Diabetes mellitus (DM) is the most common cause of vision loss in the working population and one of the most feared consequences of DM. Vision loss in DM most commonly occurs as diabetic retinopathy (DR),1 which is characterized by a combination of metabolic syndrome-induced retinal and optic nerve vascular disease and microaneurysms, leading to ischemia, hemorrhage, edema, and neurodegeneration. Given that the retina is one of the most metabolically active parts of the body, there is no surprise that DR is highly correlated with end-organ damage, peripheral neuropathy, and cognitive decline. DR is graded as 5 stages, from no vasculopathy (grade 0) to non-proliferative DR (grades 1-3), and proliferative DR (grade 4).4 Important unmet needs in the field include the lack of good early diagnostic and prognostic biomarkers of DR prior to the development of vision loss. In this study, we analyze over 200 DM and control eyes using >100 ophthalmic parameters per eye and assay longitudinal visual outcomes 4-7 years later.

Methods:
We performed a case-control study of over 130 patients with DM (218 eyes) and 67 healthy controls (95 eyes) with clinical assessment of DR grade (confirmed by retina specialist) and analyzed blood laboratory values and over 100 ophthalmic functional and structural parameters per eye, including optic disc and macular retinal microvascular measurements and optical coherence tomography (OCT) and angiography (OCTA).
We performed a case-control retrospective study of about 200 adults and 300 eyes of patients with diabetes mellitus and healthy controls and analyzed blood laboratory values and over 100 ophthalmic functional and structural parameters per eye, including optic disc and macular retinal microvascular measurements.

Results:
Longitudinal evaluation over 7 years revealed that the majority of patients followed at the Byers Eye Institute at Stanford have relatively stable visual acuity. Elevated hyperglycemia and evidence of renal failure are more common in those with moderate to severe diabetic retinopathy. Optic disc and macular thickness on OCT and vascular parameters on OCTA correlated with severity of diabetic retinopathy and can be found even in those without clinical evidence of diabetic retinopathy based on examination and fundus color imaging (grade DR0). The severity of diabetic retinopathy is graded by evidence of vasculopathy. Vascular analysis using OCTA of the most vulnerable layer of the retina (the
superficial capillary plexus) revealed significant correlation of neurodegeneration of the unmyelinated optic nerve axon with 3 vascular parameters (vessel flux, vessel area density, and vessel complexity index) in the superior and inferior peripapillary quadrants – the areas most significantly affected in DM.

**Conclusions:** Under physician’s care for about 5 years, the majority of patients with DM maintain stable visual acuity over many years (45 DM patients had 4-7 years of follow-up). Ophthalmic imaging revealed that OCTA abnormalities are striking even in patients without DR on color fundus imaging, providing strong support of use of this novel imaging modality as an early biomarker of vasculopathy and poor long-term outcome.
An Assessment of Climate Health and Environmental Justice in Medical Education and its Integration into the Curriculum at The Ohio State University College of Medicine

Lead Presenter: Cassandra L. Pasadyn

Additional Presenters: N/A

Co-Authors: Elizabeth D. Auckley, BA, Vikas Munjal, BS, Claire E. Bollinger, PhD

Purpose/Goal (Background):
Climate change is a pressing global health emergency particularly affecting disadvantaged communities. This crisis amplifies racial and socioeconomic disparities in healthcare and lacks inclusion in current medical education. The purpose of this project is to integrate programs into The Ohio State University College of Medicine (OSUCOM) curriculum to urgently address environmental injustice and empower future climate-competent physicians, working towards mitigating health disparities from climate change.

Methods:
Students assessed OSUCOM climate medical education through the Planetary Health Report Card (PHRC), an international metric-based tool, which analyzes five categories: curriculum, research, community outreach/advocacy, student support, and campus sustainability. Students developed strategies with administration to include climate health and environmental justice education across all levels of the medical program.

Results:
OSUCOM was graded an overall “C” (53.5%) on the PHRC, with an “F” (11%) in curriculum. A session for the first/second-year medical students was created on planetary health considerations, such as taking a patient's environmental history. A Sustainability in Medicine elective will also premiere for this cohort. Pre-clinical students continually review lectures to incorporate environmental learning objectives and patient care applications. Third-year students experience climate health and sustainability considerations in ground school and fourth-year students are now offered a four-week elective on the societal and health effects of climate change. Considering the student-led initiatives integrated throughout OSUCOM medical education, our projected PHRC scores for 2022-2023 is a B+ (76%), with a B (73%) in curriculum.

Conclusion/Future Directions:
We are finalizing a community health education project in sustainability, expanding planetary health research at OSUCOM, and creating additional ground school lectures around climate change to be implemented in the near future. Physicians have potential as environmental justice advocates, so building this foundation in medical school curricula is crucial to lessen the inequitable climate change impact.
Purpose: Medical students must attain the skills and knowledge necessary to provide exemplary clinical care to a diverse patient population. Currently, few medical schools have incorporated into their curriculum robust material on diversity, equity, and inclusion. Students invested in developing a workforce capable of serving patients from all backgrounds are willing and able to research and design curricular components that address this need.

Methods: Students developed a preclinical elective that teaches medical students how to use Glassick’s Criteria to design and implement a curriculum development project related to diversity and inclusion. Student leaders and faculty together assembled resources and developed modules to aid students in achieving their project goals. Faculty mentors were recruited to aid students with on-going and novel projects in curriculum design.

Results: Twenty-one first and second year medical students collaborated with 13 faculty mentors on 10 projects that covered many themes in DEI. Eleven (52.4%) students completed their projects and elective requirements by the end of the first year and 2 (9.5%) in the second year. Seven (33.3%) students completed their projects but not the elective requirements by the end of the second year. Eight out of ten projects achieved integration to the core curriculum. Projects covered many themes in diversity education: LGBTQ+ health disparities, reproductive justice, interprofessional collaboration, microaggressions, cultural sensitivity, racial and ethnic health disparities, and minority student recruitment. Projects targeted various aspects of the curriculum including lectures, small group case-based learning, clinical skills practice, and clerkship training.

Conclusions: Students have a vested interest in improving medical education for future medical students. Developing evidence-based curricula to improve the clinical knowledge, comfort, attitudes, and behaviors related to care for diverse patient populations is a key outcome of this work. Students are valuable assets in the effort to incorporate themes of DEI in undergraduate medical education.
A Comparative Analysis: Incorporating Anti-Racism in Medical Education

Lead Presenter: Larissa De Souza

Additional Presenters: N/A

Co-Authors: Temiloluwa Oladeji, Amulya Mallu, Tripti Rathi, Ifeanyi Ekpunobi, Nora Lee, Juliana Sanrame, Erica Fleming-Hall, Angelique Redus-McCoy, MD

Purpose / Goal: In 2020, students belonging to the Student National Medical Association (SNMA) and the Latino Medical Student Association (LMSA) chapters at Case Western Reserve University (CWRU) School of Medicine developed a “Racism and Health Virtual Elective” to introduce anti-racism to the medical school curriculum. This intensive two-week elective allows medical students to navigate a self-directed curriculum and meet on a two-hour weekly basis for peer-led small group discussions. Topics chosen for students to review followed the weekly themes of “History of Racism in Medicine” and “Racism as a Determinant of Health.”

In July 2022, the Association of American Medical Colleges (AAMC) introduced competencies for Diversity, Equity, & Inclusion to guide medical school curricula, indicating increased recognition of the necessary incorporation of these themes into medical education. In this study, we evaluated our virtual elective for alignment with the DEI course competency guidelines released by the AAMC.

Methods: We conducted a descriptive analysis of our approach to curriculum development of an anti-racism in medicine elective and evaluated how our course met the competencies laid forth by the AAMC’s “DEI Competencies Across the Learning Continuum” guidelines for students categorized as “Entering residency/New to DEI Journey.”

Results: The “Racism and Health Virtual Elective” met 100% of the applicable diversity competencies, 70% of the applicable equity competencies, and 83% of the applicable inclusion competencies. Across competencies that the elective did not meet, a recurrent theme was a lack of community-specific learning materials.

Conclusion/Future Directions: The “Racism and Health Virtual Elective” developed by SNMA and LMSA medical students at CWRU meets most of the competencies outlined in the AAMC DEI Competency Learning tool. In the future, we hope to incorporate community-specific topics in our course and analyze pre- and post-course survey results collected from students who have taken the course.

References:
Diversity, Equity, and Inclusion Competencies Across the Learning Continuum (aamc.org)
An institutional evaluation of race and ethnic diversity in pre-clerkship lectures

Lead Presenter: Rebekah Russell

Additional Presenters: Erica Fleming-Hall

Co-Authors: Erica Fleming-Hall; Amy Wilson-Delfosse, PhD; Karen Ashby, MD

Background
The use of race as a biological construct without proper social, political, and historical context is dangerous and can lead to the perpetuation of racism and racial and ethnic health disparities.1–4 The goal of this project was to assess the ways in which race and ethnicity are presented in the Foundations of Medicine and Health pre-clerkship curriculum at Case Western Reserve University School of Medicine and appreciate ways in which the curriculum could improve to be more structurally competent.

Methods
This project began by creating ten learning objectives to guide instructors and students on the skills and knowledge necessary to promote race and ethnic diversity in medicine. We systematically reviewed 398 lectures with 20,630 slides across six basic sciences integrated blocks from 2020-2022 looking for the following terms: race, ethnicity, Black, white, Asian, Hispanic, native American, racial, or photos of people of color. Each lecture PowerPoint was reviewed for the relevant terms and images; and the following information was recorded for each reference: faculty author, block, lecture title, number of slides in that lecture that mentioned key terms, topic covered in the lecture that included race-ethnicity, application of the term (e.g. risk, diagnostic), and areas for improvement.

Results
Curricular examination identified 245 slides across ninety lectures in the 2020-2022 preclinical curriculum that mention race, ethnicity, black, white, Asian, Hispanic, Native American, racial, or contain photos of racially and ethnically diverse people. Of the 245 slides reviewed, 220 slides (89%) mentioned key terms as biological constructs without proper mention of structural Factors.

Conclusion
The results of this project are in alignment with previous literature on the subject.17 Added context should be included throughout all the preclinical curriculum to ensure that students are prepared to effectively care for individuals from a variety of races and ethnic backgrounds.
Percutaneous Sclerotherapy in the Treatment of Morel-Lavallée Lesions: Case Series

Lead Presenter: Madeline Foo

Additional Presenters: N/A

Co-Authors: Janice McDaniel, MD

Purpose/Background: Morel-Lavallée lesions (MLLs) are soft tissue degloving injuries. Shearing between fasical layers creates space for fluid accumulation. Standard treatment for large acute lesions is drainage and compression. Unfortunately, chronic MLLs can form pseudocapsules, requiring surgical debridement. Percutaneous sclerotherapy is a viable alternative to MLLs resistant to conservative management.

Materials and Methods: We present 3 patients with MLLs treated with sclerotherapy. The electronic medical records, imaging, and procedural details were reviewed. Image-guided sclerotherapy with ethanol and/or doxycycline was performed in all 3 patients. Patients were seen in IR clinic with follow-up ultrasounds.

Results:
Case 1: A 17-year-old male developed a 22 cm MLL after dropping a barbell on his thigh. He was subsequently treated twice with ethanol sclerotherapy. The MLL resolved completely by 3-month follow-up.

Case 2: A 13-year-old female had a right thigh MLL after being trampled by a horse. Ultrasound showed a 14.3 cm collection which was treated with alcohol sclerotherapy. At 1 month follow-up the lesion measured 6.5 cm. Repeat sclerotherapy was scheduled, but the patient did not followup.

Case 3: An 8-year-old male presented with an 8 cm left thigh MLL following a bicycle accident. Following sclerotherapy with ethanol and doxycycline, the MLL measured 2.6 cm at 2-month follow-up.

For all three cases, there was significant reduction in MLL size. All patients were asymptomatic with no adverse events at follow-up.

Conclusion: Sclerotherapy, using ethanol and doxycycline, was an effective minimally invasive treatment to speed resolution of MLLs in our 3 pediatric patients.
A Case Study of Leukostasis

Lead Presenter: David Asebiode

Additional Presenters: N/A

Co-Authors: Mohamed Fayed, Nicoholas Yeldo

Hyperleukostasis is defined as a WBC of 50,000 and may lead to leukostasis. Hyperleukocytosis differs from leukostasis as it is a quantitative measure whereas leukostasis is a medical emergency that requires prompt identification. Leukostasis is most commonly seen in acute myeloid leukemia and chronic myeloid leukemia experiencing blast crisis.

A 23-year-old male whose initial presenting complaint was altered mental status. His neurologic and pulmonary conditions acutely worsened, and he required intubation with mechanical ventilation. Further work-up revealed acute myeloblastic leukemia. Leukapheresis and induction chemotherapy were initiated within 12 hours of admission. His clinical status continued to worsen and the decision to terminally wean was made 11 days after the initial AML diagnosis. To our knowledge, this is the first case reported in the literature that involves death from intraparenchymal bleeding secondary to leukostasis from acute myeloid leukemia.

Management of leukostasis centers around three primary objectives: stabilize the patient from a respiratory standpoint, begin induction chemotherapy, and consider leukapheresis. Leukapheresis is believed to aid in leukoreduction and provide immediate cytoreductive effects resulting in improvement in a patient’s clinical condition. Leukapheresis is initiated prophylactically during early signs of respiratory, CNS, or renal compromise or if blast count is greater than 100,000. The clinical efficacy of leukapheresis is monitored by measuring pre and post procedure total leukocyte count (TLC). Some evidence has shown administration of leukapheresis has resulted in 20-50% decrease in blast count.

However, Leukapheresis is a controversial therapy for this disease process and the literature currently lacks robust evidence for the addition of leukapheresis in conjunction with induction chemotherapy. As a result, many clinicians in practice prefer a more conservative approach to treatment with the use of chemotherapy rather than leukapheresis.
Myasthenic Gravis Exacerbation in Pregnancy Requiring Plasma Exchange

Lead Presenter: Gina Mavhezha

Additional Presenters: N/A

Co-Authors: Stefanie J Rodenbeck

Background: Myasthenia gravis (MG) exacerbations, especially during pregnancy, can cause significant morbidity to patients. Changes to medication regimen during pregnancy should be carefully considered.

Case: A 28-year-old female pregnant 38 weeks with known MG presented with exacerbation with generalized weakness, fatigue, double vision, shortness of breath, and trouble swallowing worsening over 2 weeks. Prior to her pregnancy, she had been taking prednisone and azathioprine with symptom control. Once pregnant, medication regimen was changed to only pyridostigmine. She then had increased muscle weakness, though symptoms worsened episodically in her first and second trimesters prompting treatment with IVIG infusions. This acute therapy did not improve symptoms. In an effort to optimize symptoms prior to delivery, therapeutic plasma exchange was utilized. Symptoms improved after first exchange; after three exchanges, examination showed only mild bifacial weakness and mild bilateral ptosis. A healthy newborn was delivered the next day uneventfully.

Discussion: Despite being on the maximum dose of pyridostigmine, our patient continued to have symptoms during pregnancy and required IVIG and plasma exchange. The patient stated that she had been sufficiently treated with azathioprine and corticosteroids before this pregnancy but was switched to pyridostigmine. The ideal regimen for MG during pregnancy is with pyridostigmine, corticosteroids, or combination. However, continuation of azathioprine and cyclosporine are considered relatively safe during pregnancy. It is not recommended to stop steroid-sparing agents or treatments or start new steroid-sparing agents during pregnancy. Azathioprine and corticosteroids at high doses have been linked to spontaneous abortion, preterm labor, and low birth weight, but in patients with MG.

Conclusion: This patient was switched from her long-term medication of azathioprine to pyridostigmine in the setting of her pregnancy; several MG exacerbations followed. This is an example of the importance of maintaining effective home regimens throughout pregnancy."
Characterization of a Chimeric Mouse PV Genome with HPV16-E6E7

Lead Presenter: Josephine Pyles

Additional Presenters: N/A

Co-Authors: Marsha DeSmet, Leny Jose, Elliot Androphy

Background/Objectives: Papilloma Viruses (PVs) are double-stranded DNA viruses that infect cutaneous and mucosal epithelium. In humans, there are over 100 types of PVs. HPV-16 is a high-risk type that causes ~50% of cervical cancers and ~70% of oropharyngeal cancers by expressing viral oncogenes E6 and E7 in replicating keratinocytes. The mouse PV, MmuPV1, displays species tropism and causes neoplastic lesions. Its discovery in 2011 introduced the opportunity to study PVs from early stages of infection to cancer development. Such an in vivo model of HPV-16 could uncover novel mechanisms for treatment intervention and disease prevention. Our study aims to characterize a small-animal infection model using a chimeric MmuPV1 genome with HPV-16 E6 and E7 in place of mouse E6 and E7 (MmuPV1-16E6E7). The goal of our study is to investigate the genome’s ability to express the HPV-16 oncogenes in vitro and to cause tumors in vivo.

Methods: To increase selective pressure in vitro, we replaced the MmuPV1 L1 and L2 genes with a neomycin cassette (MmuPV1-16E6E7neo). We packaged these genomes into infectious quasiviruses using an HEK 293TTF viral packing cell line. After isolating quasiviruses, we infected two donor human foreskin keratinocytes (HFK) cell lines. Forty-eight hours post infection, we isolate mRNA for qPCR to quantify HPV-16 E6 expression. To investigate whether MmuPV1-16E6E7 causes tumors in vivo, we infected athymic nude (N/J) mice orally with quasiviruses to evaluate infection and viable genome persistence.

Results: HPV-16 E6 mRNA was detected in three HFK isolates.

Conclusions/Future Directions: The presence of HPV-16 E6 cDNA indicates that the gene can be successfully transcribed from MmuPV1-16E6E7neo in HFKs. Future studies will assess the this in primary mouse keratinocytes. If tumors are observed in vivo, we can use this model to study the efficacy of antiviral compounds to inhibit HPV16 E6.
An investigation of the psychological effect of tinea versicolor on non-medical content creators

Lead Presenter: Ashley Perez

Additional Presenters: Larissa De Souza BS, Devin Barzallo BA, Zain Khawaja BA, Ifeanyi Ekpunobi BS, Emilio Grau Cruz BS MSc, Christina Wong MD

Co-Authors: Larissa De Souza BS, Devin Barzallo BA, Zain Khawaja BA, Ifeanyi Ekpunobi BS, Emilio Grau Cruz BS MSc, Christina Wong MD

Introduction: Tinea versicolor, or pityriasis versicolor, is a dermatologic condition prevalent in individuals between ages 21-30 and is characterized by patches of hyper/hypopigmentation and sometimes erythema, mostly affecting the trunk of the body2,3. Negative psychological outcomes, such as lower self-esteem and insecurity, have been shown in common dermatological conditions like acne vulgaris4 but have not been widely studied in tinea versicolor. As such, by analyzing YouTube videos and the vernacular of non-medical content creators, this study aims to investigate the association between tinea versicolor and negative psychological outcomes.

Methods: We screened 115 videos on tinea versicolor by searching the term “tinea versicolor” on YouTube, sorted by relevance. Of 115 videos, 34 met the inclusion criteria while 81 videos were excluded from the study because they were not in English or were created by a medical professional for the purpose of medical education. The remaining 34 videos were developed by non-medical content creators, aimed at explaining the condition and their experiences. Psychological impact due to tinea versicolor was quantified by how many creators utilized the terms “insecurity”, “embarrassment”, “low confidence”, “low self-esteem”, or “self-consciousness”, which are terms associated with negative psychological outcomes and low self-image.

Results: We found that of the 34 videos which met the inclusion criteria, 24 (70.6%) non-medical content creators used terms associated with negative psychological outcomes when discussing tinea versicolor. 10 of the 34 (29.4%) did not express terms associated with negative psychological outcomes, although three of the ten videos were created by a content creator that had used terms associated with negative psychological outcomes in another video.

Discussion/ Future Direction: Content creators on social media platforms like YouTube are gaining in popularity and becoming more numerous by the day. Many of these creators are non-medical personnel sharing their experiences with varying disease states. Our study shows that tinea versicolor has a negative psychological impact on the majority of content creators. As medical professionals, we should make note of public opinion and strive to improve the education of our patient population. Future research should aim to investigate the psychological effects of tinea versicolor on patients using a larger sample size and a more in-depth, verified questionnaire.