AUGUSTA UNIVERSITY
MEDICAL PARTNERSHIP
UNIVERSITY OF GEORGIA

12th Annual Medical Partnership Student Research Symposium

September 26, 2022

UGA Center for Continuing Education
Master's Hall

Welcome to the twelfth annual AU/UGA Medical Partnership Research Symposium!

This event is an opportunity to showcase the activities of our students during the summer between the first and second years of their medical studies. Students were encouraged to engage in a scholarly activity which could include laboratory science, clinical, or other research. Students more interested in a participatory clinical experience were encouraged to also engage in "inquisitive observation and reflection" in order to derive a more complete understanding of the health problems within the context of the greater community.

The posters represent the results of the students' endeavors. We are grateful to all of the faculty members at AU, UGA, and other institutions, who have mentored the students, and to the community clinicians, both in Athens and elsewhere, who have shared their expertise and provided the clinical settings to learn both the art and science of doctoring.

Michelle A. Nuss, MD
Campus Dean

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Risk Profile of Patients with Premature Peripheral Artery Disease: An Interim Analysis Using The Surgical Premature Peripheral Artery Disease Evaluation (SPPADE) Registry

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BACKGROUND: Premature peripheral artery disease (PPAD) is associated with an elevated risk for accelerated disease progression, adverse cardiovascular and limb events, and mortality. Research on PPAD is challenging due to the rarity of early PAD presentation, poor younger patients' representation in quality databases, and inadequate existing data on long-term follow-ups. Longitudinal data are necessary to reveal disparities and inform treatment strategies to help improve outcomes in patients with PPAD.

METHODS: We performed an interim analysis to examine the cardiovascular risk profile of PPAD patients enrolled in the Surgical Premature Peripheral Artery Disease Evaluation (SPPADE) registry. SPPADE is a retrospective multicenter registry from 9 Mass General Brigham hospitals in Massachusetts that captures baseline characteristics, management strategies, and longitudinal outcomes of young (age ≤55 years) patients with PAD. Diagnosis of PPAD (2007-2021) was established using a validated model-based algorithm and confirmed via chart adjudication.

RESULTS: A total of 246 patients with confirmed PPAD were included in this analysis (mean age=48.2; 65% male). 76% were white, 10% black, 5% Hispanic, and 9% other. Common comorbid conditions included hypertension (83%), hyperlipidemia (72%), diabetes (51%), and coronary artery disease (40%). Surgical procedures performed prior to enrollment in the registry included lower extremity endovascular revascularization (40%), coronary artery bypass graft (18%), percutaneous coronary intervention (18%), and lower extremity surgical bypass (17%). Major amputation had occurred in 8% of patients at the time of enrollment.

CONCLUSIONS: Our preliminary analysis shows a significant burden of cardiovascular disease in patients with PPAD. These data confirm the need for a comprehensive registry such as SPPADE to further study the risk factors, clinical disease course, treatment patterns, surgical outcomes, and disparities in patients with PPAD.

Assessment of Gait Function and Analysis in Patients Treated with Carbon Fiber Femoral intramedullary nails

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BACKGROUND: Hardware in orthopaedics typically consists of nails, plates, and screws made from stainless steel, titanium, or cobalt-chromium alloys. However, these implants can create artifacts on imaging studies that make them difficult to interpret. Carbon fiber implants provide greater advantages than traditional metal alloys due to less radiolucency in imaging studies, which is crucial for early detection, surveillance, and recurrences of primary or secondary musculoskeletal tumors. Previous studies have examined the benefits of carbon fiber compared to metal alloys in imaging studies; however, further investigation comparing the impact of these two kinds of implants on gait function is needed.

METHODS: This is a prospective observational study involving 34 patients that were treated for impending or pathological femur fractures due to primary/secondary metastatic bone disease. The patients will be divided into two groups based on their intervention and will be compared to patients in the other interventional group based off propensity score matching. Gait parameters will be collected using Infra-Red Vicon cameras synchronized with force plates and real-time video camera. Data analysis will be conducted to determine if there is significant difference between the two groups' gait function.

RESULTS: The total number of patients recruited for the study was 34 patients out of 124. The remaining patients were matched into two groups based off propensity score matching that included age, sex, BMI, laterality, primary tumor growth, and ECOG score. The patients will have gait parameters collected at subsequent visits and further data analysis will be conducted.

CONCLUSION: After the prospective data collection, we expect to determine if both materials are comparable for restoring gait function. If comparable, we will likely recommend carbon fiber implants in the orthopaedic oncology population given the benefits of radiolucency and better modulus of elasticity.

Carotid Bifurcation Angle as a Function of Age in Adult Women with Healthy Carotid Arteries

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BACKGROUND: Carotid artery bifurcation geometry is suspected to be a risk factor for atherosclerosis due to the impact of particular geometries on hemodynamic disturbances, ultimately leading to local vasculature endothelial cell dysfunction. Due to the potential relationship between atherosclerotic plaque development and variations in carotid geometries, the purpose of this study is to acquire bifurcation angle data for future use in investigating how the carotid bifurcation angle may serve as a predictor to disturbed flow and early wall thickening.

METHODS: Images of healthy carotid arteries from adult, female patients were previously acquired from an ongoing study using magnetic resonance imaging (MRI). The patient scans used were multi-slab, transverse 3D time of flight (TOF) MRA images through the carotid bifurcation. Carotid bifurcation angles were defined for each patient using the MRA images and the Vascular Modeling Toolkit (VMTK), an open-source software that has been used in the literature. Patient demographic information, such as age, was acquired at the time of imaging.

RESULTS: 18 carotid bifurcation angle measurements were acquired from a total of 15 patients. The angles acquired ranged from a minimum of 49.992° to a maximum of 111.825°, with a mean angle of 76.758° (SD = 15.456), and a median angle of 73.642°. The age of the patients ranged from a minimum of 47 years to a maximum of 62 years, with a mean age of 53.933 years and a median age of 55 years. There was a weak, positive correlation between the angles and age, however, the relationship was not significant $r = .298$, $N = 18$, $p = .230$.

CONCLUSIONS: The age of a patient did not significantly correlate with the carotid artery bifurcation angle; however, the weak, positive correlation may warrant further investigation with a larger sample size and age range. This preliminary carotid bifurcation angle data will be used in the future to analyze its relationship with blood flow parameters.

Do Treatments for Sialorrhea Affect Bronchoalveolar Lavage Analysis Values and Incidence of Respiratory Illness in the Pediatric Complex Aerodigestive Population?

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BACKGROUND: Children with neurological impairment, such as cerebral palsy, are often affected by sialorrhea, or excessive drooling. Sialorrhea can result in aspiration leading to respiratory disease. Bronchoalveolar lavage (BAL) analysis is routinely performed to evaluate the burden on the lungs. Studies show treatments such as botulinum toxin (Botox) injections and submandibular gland excision with parotid duct ligation (DROOL procedure) can effectively prevent sialorrhea. Our study aims to examine BAL analysis and respiratory illness in these patients to investigate the effect of sialorrhea treatments for preventing aspiration and subsequent chronic lung disease.

METHODS: A retrospective case series with chart review was performed at a single quaternary care pediatric hospital. All children <18 years of age who were diagnosed with sialorrhea, underwent either medical treatment with Botox injections and/or surgical treatment with the DROOL procedure, and had a BAL both before and/or after that treatment were identified. Demographics, medical comorbidities, treatments, ER visits and hospital admissions for 12 months before and after the intervention, and BAL findings were all recorded. Statistical analysis is ongoing.

RESULTS: A total of 24 patients that met criteria were identified. The ages ranged from 7 months to 13 years at the time of their first treatment with a mean age of 5 years. All 24 patients underwent Botox injections with several undergoing multiple treatments (range # of treatments 1-13, mean 3.8±3.9). 7 patients underwent a DROOL procedure. Of the 24 patients, 16 had a BAL both before and after the intervention and 8 had a BAL only afterwards. Data analysis looking for significant differences is ongoing.

CONCLUSION: Though data analysis is ongoing, we hypothesize that there is an improvement in respiratory illness outcomes and BAL analysis values with Botox and DROOL procedures, with DROOL procedures resulting in more effective, long-term improvement.

Interaction of Race/Ethnicity and Atopic Dermatitis Associated with Pediatric Mental Disorder with Impairment

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BACKGROUND: Atopic Dermatitis (AD) is the most common form of eczema and is one of the most common pediatric diseases. In addition to pruritis and reduced quality of life, AD is associated with psychiatric comorbidities, and both AD and many psychiatric comorbidities exhibit racial disparities in prevalence and severity. However, the intersectional effects of AD and race on mental disorder with impairment (MDI) remain poorly understood.

METHODS: This is a cross-sectional study that pooled data from the National Health Interview Survey (NHIS) years 2001-2007 and 2010-2018 among 145,399 U.S. respondents aged 4-17. Respondents were assessed for symptoms of psychiatric disorder with impairment using the validated short Strengths and Difficulties Questionnaire (SDQ): Higher average scores are associated with greater odds of MDI. Nationally representative estimates of mean SDQ scores were calculated and compared by race/ethnicity and AD using multivariable linear regression.

RESULTS: Prevalence of AD differed significantly by race/ethnicity ($p < 0.001$). SDQ total and impact score were higher for patients with AD compared to those without AD across racial/ethnic groups (each $p<0.05$). SDQ scores differed by race/ethnicity among patients with AD and among patients without AD ($p<0.001$). In multivariable models adjusting for sociodemographic factors, atopic comorbidity, and psychological comorbidity, there is a significant interaction between race/ethnicity and AD on SDQ total and SDQ impact scores ($p<0.01$).

CONCLUSION: We identified differential effects of AD on pediatric MDI by racial/ethnic group, independent of racial/ethnic differences in patients without AD and other sociodemographic differences. As MDI is common in US children with AD, these findings may assist clinicians and caregivers in recognizing patient populations with AD that are particularly vulnerable to developing MDI and providing patients with appropriate screening and referral.

An Asynchronous Wrist Ultrasound Module to Promote Medical Students' Understanding of Anatomy

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BACKGROUND: With the recent widespread availability of ultrasound technology, it has become an increasingly popular point of care tool. However, ultrasound is a highly user dependent skill. Providing medical students with ultrasound experience early in their training can increase their comfort with the imaging modality and increase their accuracy in obtaining and interpreting ultrasound images. Additionally, the use of ultrasound instruction in conjunction with anatomy education has been shown to enhance students' understanding of the musculoskeletal system. Despite the benefits, there are many barriers to incorporating ultrasound into medical education - specifically availability of curricular time and faculty availability. This project aims to reduce the burden on the curriculum and faculty by designing an asynchronous module that students can complete at their own convenience.

METHODS: This module was designed to reinforce the M1 anatomy curriculum at the AU/UGA Medical Partnership. The module focused on structures of the wrist that students are expected to learn in anatomy. Additionally, we included correlation with other imaging modalities and clinical scenarios. Powerpoint was used for the creation and delivery of the module.

RESULTS: An asynchronous module was created that provides a clear, easy to follow, step-by-step approach to identifying wrist structures using ultrasound. The module correlates with the MSK module and will reinforce their learning using other imaging modalities such as MRI, x-ray, and CT scans. We incorporated clinical correlates such as carpal tunnel syndrome.

CONCLUSIONS: We developed an asynchronous module to aid in student's understanding of wrist anatomy using ultrasound imaging.

A Retrospective Analysis of Pre/Post-COVID Characteristics of ICU Patients: Characterizing Patients Who Received A Physical Therapy Consultation from Patients Without

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BACKGROUND: After patients undergo a traumatic injury warranting an ICU admittance, it has been shown that physical therapy appears to have a considerable positive impact on bolstering the recovery of the patient. This includes decreasing hospital & ICU stay length, as well as improving quality of life. Due to the COVID-19 pandemic's strain on hospitals, this study was performed to compare the characteristics of patients receiving PT consults pre-COVID-19 vs post.

METHODS: Retrospective chart review of patients admitted to Piedmont Athens Regional (PAR) from January 2019 to December 2021. Patients were divided into groups who received PT and did not receive PT, and then further divided based on if their ICU stay was Pre (January 2019-March 2020) or Post-COVID (April 2020-December 2021). De-identified data (patient demographics, injury characteristics, severity scores, comorbidities, complications, ICU durations, ventilation days, and day of the week admitted) was assessed using Chi-squared analysis or t-test (JMP Pro 16 Software). To determine the patient characteristics most predictive of whether a patient received PT or not, logistic regression analysis was used.

RESULTS: ICU/total hospital stay was greater for patients who received PT. Patients who received PT had 1 extra day in the ICU on average and had a greater average of 5 days in hospital stay duration. Females on average received PT more so than males. Characteristics predictive of receiving PT pre-COVID were low GCS, high ISS, and ICU/ventilation days. Characteristics predictive of receiving PT post-COVID were being female, high ISS & NISS scores, ICU, ventilation, & hospital days, and more total comorbidities.

CONCLUSIONS: Despite differences in severity and length of stay, receiving a PT consultation was similar pre and post COVID. There was a significant increase in likelihood of receiving PT post-COVID for females, and a significant decrease in obtaining PT if you were admitted on a Thursday post-COVID.

A Survey of Manual Therapy Protocols used to Prevent or Treat Dysphagia in Head and Neck Cancer Patients During and After Radiation Therapy

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BACKGROUND: Authoritative research demonstrating efficacy of traditional Radiation Induced Dysphagia (RID) therapy for head & neck cancer (HNC) patients is limited. A 2019 survey reported some speech-language pathologists (SLPs) began using Manual Therapy (MT) to prevent or rehabilitate dysphagia in HNC patients. However, specific MT protocols employed remain unknown, which prevents testing efficacy. This study aims to evaluate what MT protocols SLPs use to treat dysphagia in HNC patients during and after Radiation Treatment (RT).

METHODS: An internet-based questionnaire for SLPs was developed to assess Manual therapy techniques and protocols employed by SLPs at three time points; during radiation therapy (proactive during RT), after radiation therapy completion but before dysphagia presentation (proactive after RT), and after radiation therapy completion if patients complain of a dysphagia (reactive after RT). The survey was tested for face/content validity and was sent to SLPs practicing in the USA twice, through 3 national listservs (ASHA SIG13, ASHA SIG3, University of Iowa Voiceserv), between April 2021 and July 2021.

RESULTS: Of the 44 SLPs who completed the survey, 34% performed MT proactively during RT, 84% performed MT proactively post-RT, and 100% performed MT on patients reactively post-RT. The choice of when to perform MT did not vary by SLP demographics such as experience or training, which may be a function of professional opinion or institutional culture. SLPs utilized a combination of MT techniques, specifically laryngeal manipulation (LR), myofascial release (MFR), and massage therapy (MT). Between the "during RT" and "post-RT" time points, there were differences in MT treatment frequency, MT protocols used, and recommended patient MT-self administration.

CONCLUSIONS: There is no establish MT protocol used by SLPs. However, specific MT techniques (LR, MFR and MT) are commonly employed and should be studied to formally evaluate safety and efficacy.

Deep Venous Thrombosis and Pulmonary Embolism in the Surgical and Trauma Population: A Retrospective Analysis

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BACKGROUND: Venous thromboembolisms (VTE) are a leading cause of preventable hospital deaths in the United States and results in inefficient resource utilization. Surgical patients are at a higher risk for VTE compared to hospitalized medical patients. At Grady Memorial Hospital in Atlanta, GA, causes of VTE in surgical and trauma patients treated here were identified.

METHODS: A retrospective chart review summarized characteristics of patients within the trauma registry at Grady Memorial Hospital diagnosed with VTE, ages 18+ between the years 2016-2019. Preliminary characterization of study participants, including standard summary statistics and bar graphs, was conducted in Microsoft excel.

RESULTS: A total of 233 cases of VTE were diagnosed, of which 184 (79%) were male, 49 (21%) were female, 148 (64%) were Black or African American, and 74 (32%) were non-Hispanic white. The average age was 45, BMI was 31.1, time spent in the emergency department was 7.5 hours, and injury severity score was 23. Of these patients, 43% experienced rib fractures, 27% femur fractures, and 23% pelvic ring fractures. Comorbid diabetes mellitus was identified in 26 (11%) patients and hypertension in 78 (33%) patients. Tranexamic acid was administered to 49 (21%) patients. A diagnosis of VTE was made within the first 30 days for 95% of patients and within 3 days for 37% of patients.

CONCLUSION: Further analysis will explore a hypothesized association between rib fractures and VTEs. A case-control study will be conducted to consider contributory factors of increased VTE odds.

Developing a Novel 3-Layered 3D Atherosclerosis Model

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BACKGROUND: Current *in vivo* models for studying atherosclerosis are costly, low-throughput, and limited by genomic differences, while *in vitro* models have significant shortcomings in their ability to mimic the true architecture of the human artery. This study aims to construct a novel 3-layered atherosclerosis model for more effective and efficient investigation of atherosclerosis.

METHODS: Human aortic adventitial fibroblasts (hAAFs) and human aortic smooth muscle cells (hAoSMCs) were encapsulated into gel sheets using an extracellular matrix mimicking peptide amphiphile (PA-RGDS). The sheets were assembled to form a combined hAoSMC-hAAF gel sheet, and human aortic endothelial cells (hAECs) were seeded onto the hAoSMC layer to complete the 3-layered structure. Medium containing pro-atherogenic factors was used to induce key atherosclerosis features such as endothelial dysfunction, inflammatory cytokine release, reactive oxygen species (ROS) generation, and foam cell formation. These features were evaluated against a control model that did not receive pro-atherogenic medium.

RESULTS: The 3-layered cell sheets were successfully fabricated and visualized with fluorescent microscopy. Following treatment with pro-atherogenic induction media, the hAECs showed an increase in both monocyte recruitment and expression of ICAM-1 compared to the control, suggesting appropriate induction of endothelial dysfunction. Additionally, the treated model showed increased secretion of pro-inflammatory cytokines (IL-1a, IL-1b, IL-8, IL-10, and IFN-γ), greater ROS generation, and a larger accumulation of foam cells.

CONCLUSION: An integrated 3-layered artery-mimicking model was created that demonstrated key features of atherosclerosis and overcame certain shortcomings of previous models by including an adventitial layer and forming a monolayer of endothelial cells. Thus, a prototype was developed that may better help to study the atherosclerosis disease process and therapeutic strategies.

Characterizing Follow-Up Care in Young Adult Childhood Cancer Survivors: Is Transition to Adult Care Impacted by Distance From Clinic?

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BACKGROUND: Childhood cancer survivors (CCS) are at increased risk of developing sequelae following treatment, including endocrinopathies, cardiovascular disease, and subsequent malignancies. Long-term follow-up is recommended to assess for negative health impacts. Previous research has found associations between distance from clinic and pediatric survivor care visits, but there is no literature on how distance impacts transfer to adult care in CCS. The aim of this study was to determine if distance from clinic plays a role in transitional follow-up care in young adult (YA) CCS.

METHODS: To evaluate barriers affecting CCS transition, electronic survey responses were collected from YA CCS who transferred from the Aflac Pediatric Cancer Survivor Program to adult care between 2016-2020. Zip codes were used to create geographic distance from the pediatric survivor clinic groups (<25.0, 25.0-50.0, and >50.0 miles). Chi-square, Mann-Whitney U, and Kruskal-Wallis tests were used to examine relationships between distance from clinic and engagement in survivor care after transfer from pediatrics.

RESULTS: Participants (N=94) aged 21-29 years (M=23.5±1.5) lived a median of 37 miles from clinic (Range 4-1452). One-third (31/94) of CCS had not seen an adult provider for survivor care. Models of adult survivor care included the Emory YA Cancer Survivorship Program (53%), primary care (21%), and other medical centers (4%), while 21% of CCS were unsure of where they would receive care. Distance from the pediatric survivor clinic was not significantly different between CCS who engaged in adult survivor care and those who did not (i.e., transition success, p=0.52), nor between CCS who transferred to different types of adult care (i.e., models of care, p=0.26).

CONCLUSION: Once YA CCS engage in pediatric survivor care, distance from clinic no longer influences whether they continue to follow up with healthcare providers for survivor care into adulthood or where they choose to do so.

The Impact of Socioeconomic Status, Comorbidities, and Geographic Distribution on COVID-19 Outcomes in New England Veterans

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BACKGROUND: Research has demonstrated that African-American populations experience significantly higher rates of COVID-19 infection, but systemic analyses of the impact of race, socioeconomic status, and social determinants of health on COVID-19 outcomes are limited and conflicting. This study aims to elucidate the distribution of neighborhood level distribution amongst Veterans in the New England area diagnosed with SARS-COV-2 to determine the associations and interactions between COVID-19 outcomes and 1) area deprivation index, 2) race, 3) comorbidities.

METHODS: A retrospective analysis was conducted using patient EMRs with at least one positive RT-PCR test for SARS-CoV-2 between March 1 2020 and June 1 2022. The Census Tract Lookup tool was used to obtain a GEOID linked to the Area Deprivation Index. Using STATA 16, continuous variables were used to understand descriptive statistics and univariate logistic models to predict the relationship between ADI tercile and categorical outcomes. Further data analyses will be conducted to determine the relationship between ADI and comorbidities, variants, and repeat infections.

RESULTS: A total of 8,728 veterans were included in the final study population. The mean age of patients were 40.5 years. Most participants were male, white (86%), and non-Hispanic. Of these patients, 1,201 were hospitalized and 279 died within 30 days of diagnosis. Of those hospitalized, 42.3% were hospitalized following at least one vaccination. Veterans who were hospitalized were more likely to be white (86.01%), male (90.90%), and Non-Hispanic (93.47%).

CONCLUSION: In contrast to prior research, non-white veterans as well as those in the second and third terciles did not demonstrate a higher odds of hospitalization or death to COVID-19. Further investigation into the factors, such as culture and specific outreach programs, within the VA healthcare system are needed to better understand and replicate this impact.

The Efficacy and Saftey of Vascular Closure Devices for Same Day Discharge Following Complex Ablations: A Multicenter Study

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BACKGROUND: Patients with non-valvular atrial fibrillation (NVAF) have increased risk of stroke, decreased quality of life, and increased mortality. Percutaneous catheter ablation is a cornerstone treatment for eligible patients and standard of care often includes overnight observation. Resource limitations during the pandemic forced providers across the country to evaluate strategies to improve resource allocation, notably abbreviating hospital stays. Vascular closure devices (VCD) have emerged as an alternative to manual pressure to achieve more rapid hemostasis following percutaneous cardiac catheterizations. This study aims to evaluate the efficacy, safety, and cost effectiveness various hemostatic methods following same day discharge (SDD) after complex ablations.

METHODS: A retrospective chart review of 415 patients who underwent successful pulmonary vein isolations at Piedmont Athens Regional and Piedmont Atlanta Hospital from November 2021 to May 2022 was completed. Patients were stratified by method of hemostasis. A comparison of the saftey and efficacy for each method was made based on the following criteria: SDD rate, local vascular complications including bleeding and infection, time to discharge, and hospital readmission. Cost analysis of each hemostatic method was completed.

RESULTS: *Efficacy:* SDD occurred at statistically significant higher rates in patients who received VCDs (115/122, 94.3%) in comparison to Manual Pressure (101/131, 77.1%) and Figure of Eight (129/162, 79.6%) (χ^2_1=15.8, P<.001). Similarly, time to discharge for the SDD group was shortest for VCD (4hrs 13min) followed by Figure of Eight (4hrs 34min) and Manual Pressure (5hrs 9min). *Safety:* Rates of local vascular complications were similar amongst groups: Manual Pressure (6/131, 4.6%), Figure of Eight (4/162, 2.5%), VCD (4/122, 3.3%). No SDD patients were admitted to the ED or readmitted to the hospital within 24 hours of discharge. *Cost analysis:* Higher rates of SDD for the VCD group contribute to decrease in overall burden on hospital resources; however, VCD incurs an increase in 205 USD cost per patient in comparison to other methods. 79.4% of the total VCD cost was recouped by decrease rates of NSDD for patients who received VCDs.

CONCLUSION: Vascular closure devices offer equivalent patient safety as well as decreased time to discharge and decreased overnight stays in comparison other methods of hemostasis.

Heterotaxy Syndrome: Understanding the Complex Cardiovascular Anatomic Variations in Relation to Management and Outcomes

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BACKGROUND: Heterotaxy Syndrome (HS) occurs in 1/10,000 live births and is an abnormality in laterality of the thoraco-abdominal organs. HS encompasses a variety of cardiovascular anomalies. This study evaluates the breadth of cardiac manifestations, the resultant management and outcomes among this population.

METHODS: Retrospective chart review of HS patients cared for at a single institution. Demographics, cardiac diagnoses and procedures as well as outcomes were extracted. Descriptive, univariate, and Kaplan-Meier survival analyses were utilized.

RESULTS: A total of 63 HS patients were identified with 34(56%) female, 47(75%) white and 23(36%) Hispanic. The most common cardiac diagnoses included: (42,67%) atrioventricular septal defect and (32,51%) transposition of the great arteries. A total of 45(71%) had single ventricle physiology (SV). An arrhythmia was diagnosed in 43(68%), with 33(73%) in SV and 10(56%) in non-SV(p=0.171). Most common arrhythmias included: Atrial Tachycardia 24(38%) and Supraventricular Tachycardia 18(29%). Overall, 59(94%) underwent at least 1 cardiac procedure with 29(46%) having a systemic to pulmonary artery shunts and 11(17%) a pulmonary artery band. Five (8%) mortalities were identified over a median follow-up of 6.5[IQR:1.9-12] years with all occurring in those with SV. One and 10-year survival was 98%(95%CI:95-100%) and 92%(95%CI:85-100%) overall, and 98%(95%CI:93-100%) and 90%(95%CI:81-100%) in SV.

CONCLUSIONS: The study identified a wide range of complex cardiac anatomy with the majority of patients requiring SV palliation. Despite not reaching statistical significance, all mortalities occurred in the SV population. This coupled with the known increased risk for morbidity and mortality following SV palliation points to the need to continue to improve the SV palliation pathway and to continue to work to develop new and novel surgical approaches which may allow more HS patients to undergo biventricular repair and avoid SV palliation.

Assessment of gait function and gait analysis in patients treated with megaprosthesis and 3D printed custom-made implants

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BACKGROUND: Mega-prostheses can be used for oncologic and non-oncologic purposes as an option for limb salvage surgery or after multiple revision surgeries have occurred and no other option exists. Additionally custom-made implants have become more prevalent and used for large defects in bone following resection. Importantly, these devices could affect the gait of individuals receiving these treatments, but little literature exists addressing this. Our goal is to ascertain if a change in gait does exist compared to normal subjects' gait.

METHODS: The EHR was retrospectively reviewed for individuals who have received a megaprosthesis or custom implant for oncologic or non-oncologic purposes of the lower extremity. The patients selected must ambulate unassisted and be clinically healthy. 323 patients were identified following retrospective review of the HER and were divided into groups based on location of implant. The gait cycle for each patient will be recorded via a 12 Vicon Gait camera system used for capturing of the joint motion of the subject. The camera system is synchronized with two high frequency AMTI force plat forms which record ground reaction forces.

RESULTS: Of the 323 patients identified, 53 were included in the study (proximal femur replacement N=18, distal femur replacement N=21, proximal tibia replacement N=6, total femur replacement N=3, custom extremity implant N=1, distal femur and proximal tibia replacement N=4). Patients were excluded due to being deceased at the time of chart review, lost to follow up, or presence of an antalgic gait. Currently, data collection for gait analysis and ground reaction force is on-going.

CONCLUSIONS: Data collected from this study would contribute to the small amount of literature that exists on gait analysis in this patient population. This would ultimately inform physicians on how these surgical interventions could potentially affect the patient's gait and subsequently their quality of life and functional status.

Establishing and Defining the Clinical Phenotype of Abnormal Psychomotor Behavior in Schizophrenia Spectrum Disorders

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BACKGROUND: Abnormal psychomotor behavior is a hallmark feature of schizophrenia and can be observed grossly and at the fine motor level. These behaviors were historically regarded as distinct subtypes of Schizophrenia, with gross disorganization captured under hebephrenic type and fine motor alterations captured under catatonic type. Subtypes were dissolved with the publication of Diagnostic and Statistical Manual for Mental Disorders (DSM) 5. Currently, abnormal psychomotor behavior is captured under a single criterion, A4: grossly disorganized or catatonic behavior. The clinical phenotype of abnormal psychomotor behavior has not been clearly defined and it is unclear which criterion, either disorganized or catatonic behavior, is more prevalent in patients with schizophrenia spectrum disorders.

METHODS: 347 patients with schizophrenia spectrum disorder diagnoses were identified from an ongoing study of brain structure and function. The Structured Clinical Interview for DSM-IV (SCID-IV) was used to identify participants who met threshold for abnormal psychomotor activity. Patient medical records were analyzed to identify categories of grossly disorganized behavior and to supplement examples provided by the SCID-IV.

RESULTS: 136 patients were identified to have abnormal psychomotor activity. Grossly disorganized behavior was the most prevalent phenotype with 51% of patients meeting threshold for grossly disorganized behavior only, 21% for catatonic behavior only, and 28% for both behaviors. The prevalence of the five domains of catatonic behavior were extreme negativism (59%), motoric immobility (58%), peculiarities of voluntary movement (45%), excessive motor activity (33%), and echolalia/echopraxia (20%). Categories of grossly disorganized behavior identified based on the SCID examples were wandering aimlessly (33%), unpredictable agitation (37%), unusual clothing (29%), disheveled appearance (13%), inappropriate sexual behavior (11%), and childlike behavior (4%). Other identified disorganized behavior categories were bizarre limb movements (13%), urination/defecation (8%), and unusual eating/drinking (7%).

CONCLUSION: Grossly disorganized behavior is the most prevalent clinical phenotype to meet criterion A4 for the diagnosis of schizophrenia spectrum disorders. The examples provided by the SCID do not capture the full range of bizarre behaviors documented as grossly disorganized.

Is the Kanner Rating Scale More Appropriate than the Bush-Francis Scale at Assessing Catatonia in Pediatric Patients with a Co-Morbid Neurodevelopmental Disorder

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BACKGROUND: Autism Spectrum Disorder (ASD) is one of many highly heterogeneous neurodevelopmental disorders (NDD) that present with deficits in social interaction and communication along with restricted/repetitive patterns of behaviors and interests; features that can make the assessment of catatonia challenging in these patients. The Bush-Francis Catatonia Rating Scale (BFRS) is the most commonly used scale to assess catatonia. However, this test was designed for neurotypical adults and may not be as sensitive in evaluating patients with a co-morbid NDD. The two-part Kanner rating scale offers an alternative to the BFRS.

METHODS: A cohort of 20 pediatric patients with an NDD being treated at Vanderbilt's Medical Exploration of Neurodevelopmental Disorders clinic were identified as having been assessed for catatonia using both rating scales during the same encounter. A retrospective chart review compared the relative sensitivity of the Kanner severity and the Kanner Examination scale against the BFRS by adjusting each test to represent their percentage of total possible score.

RESULTS: Using a T-Test calculator, a significant positive difference was identified between the Kanner examination score vs. the BFRS ($T=2.93$ $p= .0093$). There was also a significant positive difference between the Kanner severity score vs. the BFRS ($T=2.44$ $p= .0258$).

CONCLUSIONS: The presenting features of catatonia are likely to go unidentified in many patients with an NDD due to complexities in shared symptomology and practical challenges in applying the BFRS. We concluded that this positive shift demonstrated in the Kanner scores represents a more sensitive and specific test for detecting catatonia in these patients. Thus, implementing the Kanner rating scale is likely to lead to better clinical outcomes and an overall improvement in morbidity in this patient population.

Food Insecurity is associated with Tenofovir Diphosphate levels in Dried Blood Spots from South Africans with HIV

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BACKGROUND: Food insecurity has been linked with suboptimal adherence to antiretroviral therapy (ART) in persons with HIV (PWH). This association has not been evaluated with Dried Blood Spots (DBS), a biomarker of cumulative ART adherence and exposure.

METHODS: Within a prospective South African patient cohort, treatment-naïve PWH initiating ART who developed virologic failure (HIV-1 RNA >1000 copies/mL) were matched with controls and completed surveys assessing food insecurity and social determinants of health (SDoH). ART concentrations were quantified using Tenofovir-Diphosphate (TFV-DP) in DBS. Univariate, bivariate, and multivariate median based regression analysis compared the association between food insecurity and TFV-DP concentrations adjusting for age, gender, ethnicity, medication possession ratio (MPR), and estimated glomerular filtration rate.

RESULTS: Drug concentrations were available for 285 participants. Overall, 62 (22%) PWH reported worrying about food insecurity and 44 (15%) reported not having enough food to eat in the last month. The concentrations of TFV-DP in DBS differed significantly between those who had food insecurity worry versus those who did not (599 [IQR 417-783] vs. 716 [IQR 453-957] fmol/punch; p=0.032). In adjusted median based regression, those with food insecurity worry had concentrations of TFV-DP that were 155 (95% CI: -275 to -35; p=0.012) fmol/punch lower than those who did not report food insecurity worry. Age and MPR remained significant independent predictors of TFV-DP.

CONCLUSION: South African PWH worrying about food insecurity had lower cumulative ART adherence and exposure. This emphasizes the role of SDoHs as drivers of HIV outcomes and whether addressing food insecurity could impact clinical HIV care.

The Interaction between the COVID-19 Pandemic and Patient Outcomes: A Restrospective Analysis

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BACKGROUND: The COVID-19 pandemic heavily affected patient-care, as hospitals received an influx of infectious patients that they scrambled to prepare for. This study examined how the pandemic affected non-COVID-19 patient ICU courses and outcomes at Piedmont Athens Regional (PAR).

METHODS: This retrospective analysis reviewed charts of patients admitted to the PAR ICU from January 2019 to December 2021. Patients diagnosed with COVID-19 were excluded. Patients were then divided into two groups: those admitted before March 1, 2020 (pre-COVID) and those after (post-COVID). Chi-squared tests and t-tests compared the groups within these categories: patient demographics, injury type (blunt vs. penetrating, mechanism of injury), injury severity scores (GCS, RTS, ISS, NISS, TRISS), comorbidities, hospital course (ICU length of stay, hospital length of stay, ventilator days, PT order consultation, and time to mobilization), rate of mortality, and complications.

RESULTS: 872 trauma patients (377 patients pre-covid; 495 patients post-covid) tested negative for SARS-COVID-19. The post-COVID group, had significantly higher values for mechanisms of injury ($p<0.0001$), injury severity scores (ISS ($p<0.0001$), NISS ($p<0.0001$), TRISS ($p=0.0127$)), total comorbidities ($p=0.0083$), total complications ($p=0.0003$), and rate of mortality ($p=0.0027$). There was a significant shift in the distribution of mechanisms of injuries, such that there was a higher distribution of patients post-Covid admitted due to motorcycle accidents and other blunt mechanisms. Rate of mortality jumped from 4.8% pre-COVID to 10.3% post-COVID. There was no significant increase post-COVID for ICU and hospital length of stay, ventilator days, PT order consultations, and time to mobilization.

CONCLUSION: Although post-pandemic non-COVID ICU PAR patients had more severe injuries, more comorbidities, more complications, and greater mortality, their hospital course did not seem significantly impacted by the pandemic.

Prenatal Ambient Air Pollutant Mixture Exposure and Neurodevelopment in Urban Children in the Northeastern United States

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BACKGROUND: Prior studies of prenatal air pollution (AP) exposure on child neurodevelopment largely focus on a single pollutant. We assessed effects of prenatal exposure to a mixture of seven air pollutants on cognitive outcomes in children from an urban pregnancy cohort in the Northeastern United States.

METHODS: Analyses included 236 children born at ≥37 weeks gestation. Maternal prenatal daily exposure levels for nitrogen dioxide (NO_2), ozone (O_3), and constituents of fine particles [elemental carbon, organic carbon, nitrate (NO_3^-), sulfate (SO_4^{2-}), ammonium (NH_4^+)] were estimated based on residential addresses using satellite-based hybrid models or global 3-D chemical-transport models. Outcomes included IQ (WISC-IV), attention (Conners' CPT-II, WRAML-2), and general memory (WRAML-2) assessed at age 6.5±0.98 years. Time-weighted pollutant exposure levels were estimated using Bayesian Kernel Machine Regression Distributed Lag Models. Resulting weighted exposures were used in Weighted Quantile Sum regressions, adjusted for sex, maternal age, education, and temperature. Sex-stratified models were explored.

RESULTS: Mothers were primarily ethnic minorities (81% Hispanic and/or black) reporting ≤12 years education (68%). Prenatal exposure to the AP mixture (per decile increase) predicted decreased memory-related attention/concentration (β=-1.03, 95%CI=-1.78 to -0.27) and general memory (β=-0.64, 95%CI=-1.40 to 0.00) indices from WRAML-2, and increased CPT-II omission errors (β=1.55, 95%CI=0.34–2.77). When stratified by sex, associations with omission error score was significant in boys only, while associations with memory-related indices were significant in girls only. SO42−, NO2, and EC were major contributors.

CONCLUSION: Prenatal exposure to an AP mixture was associated with adverse child cognitive outcomes in a sex-and domain-specific manner.

Complications and Radiographic Outcomes of Operatively Treated Navicular Fractures

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BACKGROUND: Navicular fractures are uncommon foot fractures treated by orthopaedic surgeons. There is little literature exploring the complications and radiologic outcomes of navicular fractures. The purpose of this study is to examine the complications and radiologic outcomes of patients with operatively treated navicular fractures and to assess potential factors affecting these outcomes.

METHODS: A retrospective study was performed to identify patients who underwent operative treatment of a navicular fracture over a nine-year period (2013-2022). Patients were identified by review of all surgical billing that included tarsal fractures which included 293 patients. Patients were then identified by those with navicular fractures. Minimum follow-up for inclusion was 6 months. A total of 41 patients with navicular fractures met inclusion criteria. The primary outcomes examined were the patient's radiological outcomes defined as union, nonunion, avascular necrosis, foot collapse, and arthritis. Their complications were also assessed defined as infection, required reoperation, and amputation.

RESULTS: There were 34 cases with 0 complications. Of those that had complications there was 1 case of infection, 0 amputations, and 6 unplanned reoperations. Radiologic outcomes were consistent with 0 cases of nonunion, 7 cases of avascular necrosis, 3 cases of foot collapse, and 13 cases of secondary osteoarthritis. There was statistical significance between requiring a reoperation and having concomitant fractures of the cuboid and cuneiforms or having a Sangeorzan or Schmid type III classification.

CONCLUSION: Complications were observed in 41.5% of patients with post-traumatic arthritis and avascular necrosis being the most common complications observed in navicular fracture patients. Significant risk factors for requiring a reoperation include having associated fractures of the cuboid and cuneiform and having a Sangeorzan or Schmid type III navicular fracture classification.

Socioeconomic Status in the state of Alabama and its Effect on Femur Fractures

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BACKGROUND: The effect of socioeconomic status (SES) and the distance a patient's home is from their treatment center has not been studied in regard to outcomes of femoral shaft fractures. Identifying socioeconomic disparities such as income as well as locational disparities can hopefully lead to solutions to ensure better outcomes for every patient.

METHODS: A retrospective study was performed and identified 218 patients who underwent operative treatment of a femoral fractures. The primary outcomes being identified were the patient's radiological outcomes and complications defined as no complications, nonunion, required reoperation, infection, hardware complications, compartment syndrome, and soft tissue reconstruction needed. The median income of the patient's zip code was compared to the median Alabama income to assess SES status. The patient's address was also mapped by miles of road to the treatment center.

RESULTS: Most patients did not undergo any complications (69.3%). The most common complication was required reoperations (13.8%). There was no significant correlation between radiologic outcomes and complications between patients living in zip codes with income above Alabama's median income and those living in zip codes below median income. There was also no correlation between the distance the patient lives from the treatment center and their outcomes. One significant interesting finding ($p<.05$) was BMI was negatively correlated with required reoperation.

CONCLUSIONS: SES and distance from the treatment center had no impact on clinical outcomes of femoral fractures. One interesting finding that was discovered while evaluating potential confounding variables was the significant inverse correlation of BMI and reoperation rates. This supports the "Obesity Paradox" which describes the protective effect higher BMI can sometimes have. Perhaps these results can give patient's reassurance that SES will not affect their femoral fracture outcomes.

Considerations for a staged approach in a safety-net setting: a description of the outcomes of hysteroscopy

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BACKGROUND: Endometrial evaluation is required to rule out malignancy for abnormal uterine bleeding. Endometrial sampling and hysteroscopy have high accuracy to diagnose endometrial cancer. Diagnostic hysteroscopy in the operating room (OR) uses valuable OR time and surgical resources and may be better accomplished in the outpatient setting. The aim of this study was to describe the findings of OR based hysteroscopy in a safety-net setting.

METHODS: This is a retrospective cohort study of patients undergoing hysteroscopy from 12/10/2021 – 5/26/2022. Demographics, intraoperative findings and histological reports were extracted from medical records. A negative workup was considered no findings on hysteroscopy AND histology without polyp/fibroid/(pre) malignancy. Descriptive and comparative statistics were performed.

RESULTS: 177 (84 premenopausal and 93 postmenopausal) patients qualified. The indication for hysteroscopy was abnormal uterine bleeding in 92.7% and thickened endometrium in 6.8% of women. Mean OR time was 72.9 +/- 43 minutes. 47 women had a negative workup. 26 of the 47 were premenopausal, with an expected malignancy rate of 2% or less. If these negative low risk cases had undergone office hysteroscopy with office D&C, 1969 minutes of OR time could have been saved over 6 months, which extrapolates to almost 67 hours/year. Assuming the sensitivity of office sampling is 80%-95% that of OR D&C, endometrial cancer would be missed in 0.1-0.4% of low-risk patients.

CONCLUSION: Most women who underwent OR hysteroscopy had benign findings. Unnecessary OR time could be avoided if some premenopausal women had undergone office hysteroscopy with D&C and must be balanced against the risk of missing an endometrial cancer. This allows us to make system recommendations for balancing risks and benefits of office hysteroscopy, and ensure surgical resources are used for those who truly need it.

Long Term Outcomes Following Surgical Intervention for d-Transposition of the Great Arteries

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BACKGROUND: d-Transposition of the great arteries (dTGA) is the second-most common form of cyanotic congenital heart disease. Several methods for surgical correction have developed over time, with the arterial switch (ASO) becoming the preferred technique by the early 1990s. With many centers reporting low in-hospital mortality rates, the focus has now shifted to the long-term survival and complications of patients who have received a surgical repair.

METHODS: The study cohort consisted of patients with simple or complex dTGA in the Pediatric Cardiac Care Consortium (PCCC) database who underwent an arterial switch, atrial switch, or Rastelli repair at one of the 47 PCCC centers between 1982 and 2003. Patients with single ventricle physiology were excluded. Patients were linked to the National Death Index to ascertain mortality. 30-year Kaplan-Meier survival after surgical repair was estimated for each group.

RESULTS: Of the 1809 patients who survived to hospital discharge, 1371 (75.8%) received an ASO, 333 (18.4%) received an atrial switch, and 105 (5.8%) received a Rastelli operation. The median follow-up time was 24.1 years. Patients undergoing ASO had the highest 25-year survival: 95.8% (94.7-97.0%), followed by Rastelli: 85.2% (81.5-89.1%), and atrial switch: 89.1% (83.1-95.4%).

CONCLUSION: Patients who received the arterial switch operation have higher long-term survival compared to those with atrial switch as expected since those were mainly performed in an earlier era. Despite the more complex anatomy of patients undergoing Rastelli operations, long-term survival is still promising. Further work is in progress to identify risk factors for survival within the cohort, as well as identifying non-fatal consequences such as reintervention rates to further characterize the long-term survival of dTGA patients.

Time to Achievement of Clinically Significant Outcomes Following Isolated Arthroscopic Meniscus Repair

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BACKGROUND: To comprehensively define the time required to achieve outcomes (CSOs) after arthroscopic meniscal repair (AMR). The primary outcome was to identify an evidence-based timepoint for functional recovery, including the time needed to attain minimally clinically important difference (MCID) and patient acceptable symptomatic state (PASS) for isolated AMR.

METHODS: Patients who underwent isolated AMR between 2015 and 2021 were collected. Those with completed preoperative and at least 1 post-operative (6-month, 1 year, and 2 years) Patient-Reported Outcome Measures (PROMs), including International Knee Documentation Committee (IKDC), Patient-Reported Outcomes Measurement Information System Physical Function(PROMIS PF), or Knee Injury and Osteoarthritis Outcome Score (KOOS) were included. MCID and PASS for each PROM were identified from prior literature and utilized as a threshold needed to attain functional recovery. The time needed to achieve CSO was then calculated and plotted using Kaplan-Meier survival analysis.

RESULTS: Of the 71 included patients (33.8% female, age: 30±14.9 years), 69 patients had completed IKDC forms, and 41 had completed PROMIS PF forms. Patients attained IDKC achievement rates of 84% for MCID and 68% for PASS, and PROMIS PF achievement rates of 80.5% for MCID and 78% for PASS. Median achievement time across all surveys (IKDC, PROMIS PF, and KOOS) ranged between 5.27 - 5.31 months for MCID, and between 5.21–5.40 months for PASS. Averages for achievement time for MCID ranged from 6.28–8.20 months, and for PASS from 6.42 – 9.51 months, in respective PRO surveys.

CONCLUSION: The majority of patients (72%) undergoing AMR achieved benefit within 6 months of surgery (overall median: 5.3 months), with diminishing proportions at later timepoints. The timeline for achieving improvement that was established by this study may aid in setting patient expectations and designing future outcome studies involving AMR.

Prevalence of Occupational Injuries and Other Traumatic Injuries Among Limited-English Proficient Populations

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BACKGROUND: Work related injury remains a high cause of morbidity among Limited English Proficient (LEP) individuals in the United States. A retrospective review of Grady Trauma Registry data demonstrated that from 2019-2020, 257 non-English speaking patients were admitted for a traumatic injury and 22% of admissions were due to an occupational injury. Few hospital-based interventions currently exist for LEP patients presenting with traumatic injuries including occupational injuries. The objective of this study was to identify injury patterns among LEP patients discharged from the Grady Memorial Hospital Emergency Department (GMH ED) in order to develop future hospital-based interventions..

METHODS: A retrospective chart review of all LEP patients presenting to the GMH ED was performed from January 2020-December 2020 using data extracted from the Electronic Health Record (Epic). Demographics, chief complaints and diagnoses for all traumatic injuries were assessed. Data were analyzed using Excel.

RESULTS: A total of 253 LEP patients presented to and were discharged from the ED with traumatic injuries. 66% of patients were male and 34% were female. The mean age was 41 years of age. The top primary spoken languages were Spanish (n=214) and American Sign Language (n=10). The most common traumatic injuries that occurred included motor vehicle collisions (n=97), falls (n=41), and assaults (n=24). Given limitations with the data set, we were unable to delineate occupational injuries from the chief complaints and diagnoses.

CONCLUSIONS: LEP populations frequently presented to and were discharged from the ED after a traumatic injury. LEP populations face many barriers to care and few culturally and linguistically appropriate resources exist for LEP populations. Future work will focus on developing injury prevention resources and hospital-based interventions for LEP populations presenting with traumatic injuries.

Carpal Tunnel Release Procedure Cost and Complication Comparison by Venue

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BACKGROUND: Open carpal tunnel release is one of the most common surgical procedures performed in the United States. The procedure can be performed in hospital based operating rooms, ambulatory surgery centers, or as an office-based procedure. The primary objective of this study is to evaluate safety and cost saving potential of office-based carpal tunnel procedures as an alternative to ambulatory surgery centers and hospital-based procedures.

METHODS: Patients who underwent unilateral primary carpal tunnel release in the calendar year of 2021 were identified and retrospectively studied. Carpal tunnel release procedures were classified based on surgical venue including hospital-based procedures, ambulatory surgery centers (ASC's), and office-based procedures. Outcomes were determined by presence of infection and need for additional procedures. Reimbursement rates and charges to patients were obtained to analyze costs.

RESULTS: 386 patients were identified. 147 had office-based procedures, 229 had ASC based procedures, and 12 patients had a hospital based operating room procedure. No patients were diagnosed with deep infection post-procedurally, irrespective of venue. Additional revision procedures were required in 2 in-office patients and 1 ambulatory surgery center patient. The results showed no significant difference in outcomes between venues (P=0.82). For Medicare insured patients, in office procedures provide a cost savings of $356.05 when compared to hospital outpatient departments, and cost savings of $162.05 when compared to ASC's. For commercially insured patients, in office procedures provide an estimated saving of $226.87 and $498.47 when compared to ASC's and hospital outpatient department's, respectively.

CONCLUSIONS: Office-based open carpal tunnel release surgeries can provide a safe and effective procedure while providing cost savings to patients when compared to ambulatory surgery centers and hospital-based procedures.

Gauging the Effectiveness of a Trauma-Informed Care Communication Checklist at the Marcus Trauma Center at Grady Memorial Hospital

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BACKGROUND: Trauma-Informed Care (TIC) is centered around four core principles: realize the widespread impact of trauma, recognize signs and symptoms, respond by changing procedures and practices, and resist re-traumatization. TIC is especially important for patient outcomes and satisfaction in fast-paced medical environments like the Marcus Trauma Center (MTC) in Grady Memorial Hospital (GMH). One barrier to TIC is communication within the medical team. Our goal is to evaluate residents' knowledge and opinions about TIC, encourage a TIC communication checklist for MTC providers, and gauge its effectiveness with pre-and post-surveys after 8 weeks.

METHODS: A 26-item online, anonymous Likert Scale survey was adopted, edited from a research team at the University of Pennsylvania and sent to ED and surgical residents at GMH. The questions were split into four domains: knowledge, opinions, self-competence, and report of TIC practice in the past month. On a separate date, an online TIC lecture was presented and a new TIC communication checklist protocol was rolled out to the same residents. They were encouraged to utilize this protocol in MTC while seeing trauma patients. Utilization is being monitored and the same survey will be sent after an 8-week period or checklist utilization.

RESULTS: Survey responses from 52 MTC surgical residents were analyzed on JMP Pro 16. 80% of respondents answered correctly about TIC knowledge. Opinions generally favored TIC, with an 80.3% agreeable response. An average of 51.3% of respondents self-rated their TIC competence as "somewhat competent" and 64% do not currently practice TIC. We plan to collect responses to the same survey after 8 weeks of the new TIC protocol.

CONCLUSION: Overall, many residents currently know and understand the importance of TIC but are struggling with providing TIC at MTC. We are hoping that the TIC communication checklist will improve care and cohesiveness among the healthcare team.

Does Distance from Treatment Center Affect Six Month Follow-up in Femur Fractures

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BACKGROUND: Follow-up after traumatic orthopedic injuries is crucial in ensuring adequate recovery and screening for adverse outcomes. Continuity of care continues is an inherent challenge in every field of medicine, yet the factors influencing it have rarely been studied. Femur fractures are one of the most common long-bone fractures, and a typical and routine course of recovery makes them an ideal injury in which to study follow-up across all ages and demographics.

METHODS: 772 patients were identified using CPT codes for fixation of femur fractures. Of the 680 that met study qualifications, data including age, length of follow-up, and distance to treatment center was collected retrospectively. Patients were separated into groups based on a length of follow-up greater than or less than six months.

RESULTS: AUsing a two-tailed two-sample T-Test calculator, there was no significant difference in distance to treatment center at the six-month follow-up threshold ($p=0.11$).

CONCLUSION: Distance to treatment center, one of various barriers to healthcare, does not affect a patient's likelihood to follow-up at six-months threshold following fixation of a femur fracture. Incidental findings of this study identified a significant correlation between distance and likelihood of follow-up at the 12-month threshold. Possibly do to variables not identified in this study, this relationship requires further investigation to determine variables affecting likelihood of follow-up and improve continuity of care in the emergency setting.

Racial/Ethnic Disparities in Ischemic Stroke Treatment and Outcomes in the United States

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BACKGROUND: Stroke is the fifth leading cause of death and leading cause of long-term disability in the US. Racial disparities exist in the utilization of tissue plasminogen activator (tPA) and endovascular thrombectomy (EVT) as treatment for ischemic stroke. Previous studies have shown that Black ischemic stroke patients are less likely to receive both tPA and EVT than White patients. This study explores the racial/ethnic differences in 1) receiving tPA and EVT and 2) poor outcomes after being treated with tPA or EVT.

METHODS: An observational analysis of 89,035 ischemic stroke patients from the 2019 National Inpatient Sample was conducted. We performed a logit regression on the relationship between race/ethnicity and tPA and EVT utilization. We also performed a logit regression on the relationship between race/ethnicity and poor outcomes (discharge to a nursing facility or in-hospital mortality) after being treated with tPA or EVT. All analyses controlled for confounding variables.

RESULTS: Non-Hispanic (NH) Black patients had significantly lower odds of receiving tPA than NH White patients (O.R.=0.85, 95% C.I.: 0.80-0.91, P=<0.001). NH Black patients had significantly lower odds of receiving EVT than NH White patients (O.R.=0.75, 95% C.I.: 0.70-0.82, P=<0.001). There was no significant difference between races and in-hospital mortality or discharge to a nursing facility for patients who received tPA or EVT.

CONCLUSION: Black ischemic stroke patients were less likely to receive tPA and EVT. However, there was no racial difference in the poor outcomes of in-hospital mortality or discharge to a nursing facility among patients who received tPA or EVT. Even though Black patients do not have worse outcomes after receiving tPA and EVT, Black patients still receive these treatments less often. This study calls for the development of interventions to expand the access to and utilization of tPA and EVT in order to improve stroke care for minority patients.

Radial nerve grafting: determining optimal length for grafting

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BACKGROUND: Radial nerve injuries can cause loss of function of the upper extremities, specifically in extension of the elbow, wrist, fingers, and thumb. In cases where the radial nerve is broken and the two ends cannot be reapproximated, one treatment option is to use a nerve graft to bridge the gap. We sought to determine the optimal graft length is for patients with radial nerve injuries.

METHODS: Retrospective chart review of 39 patient who underwent radial nerve grafting procedures at Grady Memorial Hospital, MacKay Memorial Hospital, and Chang Gung Memorial Hospital from 1990 to 2021 was performed. Long-term functional outcomes were assessed using the Medical Research Council's (MRC) scale of muscle power, with a score ≥3 being considered a successful outcome. Demographics, surgical parameters, and complications were also assessed. Unpaired t-tests and ANOVA tests were utilized as appropriate using Excel Data Analysis.

RESULTS: 79% (31) of patients achieved and MRC score ≥3 for wrist extension, 44% (17) for finger extension, and 38% (15) for thumb extension. Graft length had a significant, negative correlation with MRC score for wrist extension ($p=0.022$, $R2=0.094$), but the negative correlation failed to maintain statistical significance for elbow, finger, or thumb extension. While age was the only prognostic factor to significantly correlate with MRC score for wrist, finger, and thumb extension ($p=0.020$, 0.033, 0.034, respectively), other factors, such as BMI, maintained statistically insignificant, negative correlations with MRC score.

CONCLUSION: This study found a significant negative correlation between graft length and functional outcomes, and it found age to be negatively correlated with functional outcomes. For patients with radial nerve injuries, it is important to consider both the patient's age and the length of graft necessary to connect the ends of the injured nerve when determining if grafting is appropriate.

Implementation of an Enhanced Recovery Program in Vascular Surgery and its Impact on Racial Disparities

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BACKGROUND: The implementation of an enhanced recovery program (ERP) has previously been shown to mitigate racial disparities in outcomes after colorectal surgery; the objective of this project is to determine if similar results can be seen in vascular surgical ERP program for lower extremity bypass.

METHODS: This is a single center, retrospective analysis of lower extremity bypass patients treated from April 2018 to June 2022 before and after implementation of an ERP pathway. Primary outcome was the post-operative length of stay and secondary outcomes included complications, surgical site infections, readmission, re-intervention, and mortality. Only black and white patients were included and if a patient had multiple procedures occurring on the same leg and within one year the latter intervention's data was excluded.

RESULTS: Of the 409 patients (180 pre-ERP and 229 ERP), 39.4% were Black. Black and White patients were similar with respect to body mass index, smoking status, diabetes, age, and American Anesthetic Association class, but were dissimilar with respect to insurance status, sex, and social indices. There was no significant difference in post-operative length of stay between pre-ERP and ERP Black patients while White patients demonstrated a 2 day reduction in post-operative length of stay ($p<.001$). Greater levels of adherence to the entirety of the ERP protocol (>70%) correlated with a decreased post-operative length of 1.5 days in black patients ($p<.01$) and a decrease of 3 days in white patients ($p<.001$).

CONCLUSION: After implementation of an enhanced recover protocol for lower extremity bypass, a significant reduction in both total and post-operative length of stay was achieved, which was more apparent in White versus Black patients. When accounting for adherence to the protocol, the racial disparity was less apparent, indicating areas for focused improvement in the futures.

Role of Brain-derived Neurotrophic Factor in Stroke Recovery

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BACKGROUND: Brain Derived Neurotropic Factor (BDNF) is promotive of synaptic plasticity within the motor cortex. While prior studies have correlated stroke outcomes and serum BDNF levels, such measurements are not necessarily reflective of brain BDNF concentrations. Our study addresses this deficiency by probing microglial cells, which, along with neurons and astroglia, are responsible for generating BDNF in the brain. Specifically, our study evaluates microglial exosomes – extracellular messenger vesicles which pass the blood brain barrier – through peripheral blood draws for comparison with stroke functional recovery data.

METHODS: Subjects from the Wide Spectrum Investigation of Stroke Outcome Disparities on Multiple Levels (WISSDOM) study were randomly selected from four groups: non-stroke controls, baseline post-stroke (PS), 3 months PS, and 12 months PS. Glial cell derived exosomes were isolated using ExoQuick Ultra kits and TMEMM119 antibodies. Isolate composition was verified by ZetaView nanoparticle tracking analysis and mature and pro-BDNF content was quantitatively determined using ELISA. One-way ANOVA analysis was identified significant differences in BDNF content across test groups and correlation analysis defined relationships between BDNF levels and stroke outcomes based on NIH stroke impact scales and modified Rankin Scores.

RESULTS: Samples subjected to nanoparticle tracking analysis thus far are indicative of successful exosome isolation and ELISA studies reveal a decrease in pro-BDNF levels in microglia-derived exosomes at 12 months PS compared to baseline PS and non-stroke controls. Additional analyses are on-going.

CONCLUSION: While we are awaiting BDNF-stroke outcome correlations the observed conversion of pro- to mature BDNF in stroke patients over time suggests BDNF involvement in recovery processes. Our preliminary study serves as an important translational step in the evaluation of BDNF as a potential therapeutic for stroke treatment.

Recidivism Among Persons Living with HIV Receiving Extended-Release Naltrexone

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BACKGROUND: In the United States, a disproportionate number of persons living with HIV and OUD (opioid use disorder) are involved in the criminal justice system. Medications for opioid use disorder (MOUDs) can reduce convictions and incarceration time in patients with OUD. Extended-release naltrexone (XR-NTX), a form of MOUD, has also been shown to maintain HIV viral suppression in those recently released from incarceration. This study aimed to describe risk factors for recidivism and to evaluate if treatment with XR-NTX was associated with reduced recidivism.

METHODS: Data was analyzed on 77 participants living with HIV and OUD who were previously incarcerated in a Connecticut jail or prison, using a generalized linear model to estimate odds ratios associated with recidivism and a Kaplan-Meier survival analysis to determine time to recidivism. Demographic, behavioral, and clinical characteristics of reincarcerated and non-reincarcerated individuals were compared.

RESULTS: Of the 77 participants, 41 (53.2%) were reincarcerated. The mean time to recidivism was 190 days (SD = 108.3). Compared with participants who remained in the community, reincarcerated participants were more likely to have major depressive disorder at study baseline, increased opioid cravings, longer mean incarceration time at study baseline, and a higher Quality of life, SF-12 physical composite score. Non-reincarcerated individuals were not more likely to be on treatment with XR-NTX.

CONCLUSION: Given the high proportion of persons living with HIV and OUD in the U.S. justice system, recidivism is not only a concern of public safety but also of public health. Novel efforts to prevent recidivism in this population should be undertaken. Treating depression in recently released individuals could benefit both viral suppression and recidivism efforts.

Development of a Secondary Education Mini-Medical School Camp: Implementing Small Group Learning and Simulation Lab Experience to Promote Interest in Pursuing STEM Careers

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BACKGROUND: Georgia ranks last in access to care and maternal mortality, with Black women having a 3.3 times higher likelihood of mortality than White women. Additionally, ~ 90% of counties in Georgia are medically underserved areas. This is in large part due to a physician shortage in Georgia, not only by numbers but also diversity. While 28.1% of Clarke County's population identifies as Black, only 4.8% of the local physicians are Black. To reduce these disparities, we want to foster student engagement, encourage curiosity, and support students in the local community who are interested in pursuing medicine. We did this by conducting a Mini-Medical School Camp and providing scholarships to local students. While conducting this camp, we revised our curriculum, structure, and learning environment. Here, we will showcase many changes that were beneficial and share ideas to benefit similar camps.

METHODS: We developed two curricula for different age groups based on the academic model of AU/UGA Medical Partnership's program of incorporating small group learning, hands-on application, and lecture-based learning. Each day focused on one body system, and on Friday, students applied their knowledge in simulation labs, where they communicated with patients and determined their diagnosis.

RESULTS: We developed 2 summer camp curricula that were implemented and revised throughout 6 weeks of camp. Mini-Med 1 and Mini-Med 2 had a total of 118 and 99 students participate, respectively.

CONCLUSIONS: We developed and executed a Mini-Medical School curriculum that fostered student engagement, encouraged curiosity, and supported students in the local community who are interested in pursuing medicine in hopes of reducing demographic disparities in Georgia.

Investigating Race/Ethnic Disparities in Retinopathy of Prematurity

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BACKGROUND: Retinopathy of prematurity (ROP) is an angiogenic eye disease affecting 14,000 infants in the U.S. per year and is a leading cause of preventable blindness. Two well-documented factors are known to increase the risk of ROP development: a birthweight of <1250g and premature birth of <30 weeks gestational age. Recent research has attempted to identify other factors such as social determinants of health including race/ethnicity that may also increase the risk for ROP progression to vision threatening stages (Stage 3-5). Some studies have found that infants from minority racial/ethnic groups are more likely to be diagnosed with severe ROP (vision threatening ROP) as compared to non-Hispanic whites. Despite these results, little is known about the association between race/ethnicity and severe ROP. Given that minority groups now comprise 41% of the total population in the country, understanding racial/ethnic disparities in ROP progression to vision threatening stages could lead to better management and prevention of low vision in at-risk populations.

METHODS: A retrospective chart review was performed on patients born between May 2019 and January 2022 with stage 3 ROP (n=51) using Vanderbilt University Medical Center's (VUMC) Research Derivative. Data including race/ethnicity, birthdate, diagnosis date, and treatment dates were analyzed to examine the relationship between race/ethnical disparities in diagnosis and management of the disease. Population by race/ethnicity in the stage 3 ROP cohort were compared to that of infants with a birthweight of <1500g at VUMC to test observed and expected values. Time to diagnosis and time to first treatment by race/ethnicity were also compared respectively to search for disparities in the management of Stage 3 ROP in the cohort.

RESULTS & CONCLUSION: The results and conclusions of this study are pending data analysis.

Progestin-Based Contraceptives Effect on Vaginal Microenvironment Using Clinical Indicators: pH, Clue cells and Patient Reported Symptoms

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BACKGROUND: There is mixed evidence regarding progestin-based contraceptives effects on the vaginal microenvironment and specifically BV incidence. BV is typically clinically diagnosed using Amsel Criteria: having 3+ of the following: vaginal pH>4.5, thin/white abnormal discharge, fishy odor, and/or clue cells seen on wet prep. All these markers are indicators of general vaginal microenvironment health. As contraceptives, such as the IUD and the Nexplanon implant, become more popular it is important to understand the effect they have on the health of the vaginal microenvironment.

METHODS: AAn original cohort of 53 CHIME study participants with complete physical exam data was selected. After hormone data was cross referenced 43 participants were in the Luteal phase (LP) and 50 in the Follicular phase (FP) for physical exam data. A separate cohort of 66 participants was created that included only reported symptoms data. After hormone data was cross referenced a cohort of 57 participants in the LP and 63 participants in the FP were selected. Presence of clue cells, vaginal pH and reported symptoms were sorted.

RESULTS: There was no significant difference when comparing cycle phase or before and after contraception initiation for presence of clue cells and reported symptoms, however there was a significant change in vaginal pH. Mean vaginal pH significantly increased for the entire sample from the FP to post-contraceptive visits ($p=.03$). Participants who had normal pH at baseline had a significant increase in mean pH from their LP compared to post-contraception ($p=.01$) as well as FP compared to post-contraceptive ($p=0.0002$).

CONCLUSIONS: Progestin-based contraceptives have an impact on the vaginal microenvironment, especially vaginal pH, and as a result can have an impact on overall health. With progestin-based hormonal contraceptives becoming increasingly popular, it is important to understand their implications on the overall health of patients.

Validating a New MR-Compatible Tablet for Assessing Brain Activity during Visually-Guided Hand Movements

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BACKGROUND: Functional magnetic resonance imaging (fMRI) has been used to understand the neural representations of visually-guided hand movements. A major challenge is recording participants' movement and providing them real-time visual feedback. To further the utility of fMRI in studying such movement, this investigation aimed to validate the efficacy of a custom tablet designed to be MR-safe, produce minimal noise in fMRI data, allow for visual feedback, and track finger movement reliably.

METHODS: A tablet was designed with low-cost, non-ferromagnetic materials to track position, force, and time of touch. Two tests were run: the first involved scanning a phantom with and without the tablet in the MRI bore (3T GE Discovery MR750) to assess effect on image quality. The second test involved measuring the fMRI blood oxygen-level-dependent (BOLD) signal as one participant completed two movement tasks. First, they sequentially tapped their fingers on the tablet. Second, they traced their index finger on the tablet to move a cursor on a screen and follow a target with a smooth, unpredictable trajectory.

RESULTS: The temporal signal-to-noise ratio (tSNR) measured when phantom scanning was qualitatively similar, though slightly decreased, with the tablet in the MRI bore (128.9) vs. without (140.6). fMRI data from the tapping and tracing tasks underwent standard pre-processing and analysis with a general linear model. Whole-brain contrasts showed significant differences in BOLD activation in sensorimotor regions during movement, matching results in prior experiments ($p<0.001$).

CONCLUSIONS: We designed a new tablet that can successfully record and display hand movement during fMRI scanning. The fMRI data showed similar brain regions active with using the tablet as with manual movements without the tablet, though the tablet added noise that may reduce image quality. This design may help future fMRI studies more systematically explore the neural basis of hand movements.

What is the Cardiovascular Impact of Trauma Interviewing in Post-Traumatic Stress Disorder? A Focus on Autonomic Function in Vietnam-Era veterans

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BACKGROUND: Post-traumatic stress disorder (PTSD), affecting over 30% of veterans from the Vietnam War era, has been associated with an increased risk of cardiovascular disease (CVD). Autonomic dysfunction has been implicated as a potential mechanism linking PTSD and CVD. We hypothesize virtual, trauma-focused interviewing will trigger autonomic dysfunction in participants affected by PTSD, measured by reduced heart rate variability (HRV), thereby implying acutely increased CVD risk.

METHODS: We studied 10 Veterans, of whom 5 (50%) had past or current PTSD. They underwent virtual psychiatric interviews at home via the Structured Clinical Interview for DSM-5 (SCID-5) with ambulatory electrocardiographic (ECG) monitoring. We analyzed ECG for deceleration capacity (DC) and low frequency (LF) HRV during both neutral interviewing and trauma-focused interviewing sessions in which they described their past traumatic experiences. DC was selected given its well-established measure of parasympathetic mediated vagal activity, and LF power was selected given its sensitive measure of overall autonomic balance. We calculated the mean 5-minute HRV for each session and compared groups by interview type and PTSD status. We log-transformed LF HRV for normality.

RESULTS: We studied 10 Vietnam-era veterans (mean (SD) age 73 (3) years, 30% Black race), In the non-PTSD group, log LF HRV increased by 46% and DC reduced by 12% during the stress interview compared to the neutral interview. In the PTSD group, log LF HRV reduced by 38%, and DC reduced by 16% in the stress versus neutral interview.

CONCLUSIONS: In this pilot investigation, we found HRV reduced during the trauma interviews compared to neutral interviews in the PTSD group, however significant conclusions cannot be made. Further study in a larger sample with additional HRV metrics is warranted.

Predictors of Antipsychotic Prescribing Practices among Foster Care Youth in Utah: A Statewide Assessment

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BACKGROUND: Children in foster care often have complex trauma histories and clinicians often treat traumatized children with psychotropic medications when conditions are rooted in trauma. Antipsychotic medications are highlighted as a frequently prescribed medication among foster care youth, often in the absence of evidence-based, trauma-informed psychosocial interventions. We aim to identify factors associated with antipsychotic treatment within foster care (UPOP+SGA) compared to psychiatrically treated foster youth without antipsychotic treatment (UPOP-SGA) and non-psychiatrically treated foster care youth (non-UPOP).

METHODS: Data from foster children collected from Jan 2019-Dec 2021 was utilized to create 3 cohorts: non-UPOP, UPOP-SGA, and UPOP+SGA. UPOP contact was defined as those ≤6 being prescribed ≥1 psychotropic medications or ≥7 being prescribed ≥2 psychotropic medications. T-tests/ANOVA, Chi-squared tests, and fisher exact tests compared demographics, months in care, placement reason, level of care, psychotropic medication count, medication, and condition among the three cohorts. Logistic regression was used to determine influencing factors for antipsychotic treatment.

RESULTS: Of 7167 individuals, 1465 had UPOP contact, of which 641 patients received ≥1 antipsychotic prescription. T-tests, Chi-squared tests, and fisher exact tests between UPOP populations found that UPOP+SGA have more and different psychotropic medications and different diagnoses. UPOP+SGA were more often male, older, spent more time in care, and were placed in higher levels of care. Logistic regression shows important clinical differences among UPOP+SGA compared to UPOP-SGA.

CONCLUSIONS: This study furthers knowledge on antipsychotic prescription practices within foster care. This data will support practice guidelines, policy changes and that programmatic strategies to provide trauma-informed supports to targeted foster care populations, designed to impact antipsychotics prescribing.

Negative Regulation of Peripheral Axon Regeneration Mediated by Atf4-Dependent Transcription

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BACKGROUND: In contrast to the central nervous system (CNS), the peripheral nervous system (PNS) exhibits elevated axon regeneration and functional recovery upon axon injury, largely mediated through MAP kinase stress signaling stimulation. However, the regenerative capacity of the PNS is often insufficient to completely restore functionality and declines with age.

METHODS: An siRNA screen performed on adult sensory neurons in vitro provides evidence that Activating Transcription Factor-4 (Atf4), a key mediator of a second branch of axonal injury signaling known as the Integrated Stress Response (ISR) is a negative regulator of regeneration. To assess the role of Atf4 in the transcriptional regenerative response, we performed bulk RNA sequencing on cultures enriched for adult sensory DRG neurons derived from Atf4 conditional knock-out mice. Atf4 knock-out resulted in over one thousand differentially expressed genes, suggesting neuronal Atf4 is a substantial contributor to the injury-induced transcriptional program.

RESULTS: Interestingly, Atf4 knock-out has a modest effect on canonical regeneration-associated genes like Sprr1a, Atf3, and Klf6, alluding Atf4 does not act as a regenerative repressor by direct repression of pro-regenerative response genes. Parallel gene expression profiling of siRNA-treated cultures was leveraged to understand the contribution of the ISR to the transcriptional response. We were able to stratify Atf4-depdnent genes into groups that are (1) dependent upon Perk, an endoplasmic reticulum stress-responsive kinase (2) dependent upon the CCAAT/enhancer binding protein-gamma (C/ebp g).

CONCLUSIONS: Taken together, the data reveal a role for the ISR in the transcriptional response to peripheral axon injury that may be targeted therapeutically to enhance nerve repair. In understanding the pathways of nerve degeneration and regeneration, we can better harness what roles they play in many key neurodegenerative disorders.

Determining Barriers to Nutrition for Low-Income Patients in the Athens Area

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BACKGROUND: Low-income populations are at higher risk of being food insecure. Access to healthy food is important in the overall health of these populations. The focus of this study is to identify barriers to obtaining and preparing healthy meals.

METHODS: The patients at Mercy Health Center must meet specific income criteria (≤150% federal poverty level) in order to receive care, therefore, the patients surveyed are a sample of low-income populations in the Athens area. Patients were asked 8 questions regarding barriers they face in relation to obtaining and preparing healthy meals.

RESULTS: A total of 40 patients (n=40) were surveyed during the summer of 2022. Cost of food was reported by 64.1% of patients to be the main limitation when trying to eat healthier, followed by time needed to cook (20.5%) and capability of cooking at home (10.3%). When asked what their main source of transportation was to get to a grocery store, 77.5% of patients said they would take their car, followed by someone else's car (17.5%) and bus (5%). Forty percent of patients stated that limitations associated with physical or mental health make cooking difficult. At least 97.5% of patients stated that they have access to a stovetop, refrigerator, freezer, water, pans, and dishes, while only 70% stated that they have access to a crockpot.

CONCLUSIONS: The main barriers to healthy eating in this population were cost of food, health-related limitations, and transportation.

Adverse Childhood Experiences as Predictors of Follow-up in Primary Care

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BACKGROUND: Previous research has linked adverse childhood experiences (ACEs) with poor health outcomes and socioeconomic burden. We suspect baseline ACEs are a key factor in follow-up visit patterns among adult patients in primary care. This study examines the prevalence of ACEs in an urban primary care clinic and potential associations between ACE score and key demographics, disease states, and sociological variables.

METHODS: Patients over 18-years-old presenting for a primary care visit at Grady Memorial Hospital in Atlanta, GA were surveyed using the 10-item ACE questionnaire. Variables including age, sex, race, ethnicity, BMI, zip code, education, insurance, employment, disability, hypertension, coronary artery disease (CAD), diabetes mellitus (DM), depression, anxiety, PTSD, mood disorders, and ADHD were extracted from the electronic medical record EPIC™. Preliminary statistical analysis was performed using Excel™, where we conducted simple stratification and Chi-squared analysis on key variables. Future extraction of follow-up visit data is also planned.

RESULTS: Of 200 responses, 64% had 2-3 ACEs and 25% had 4+ ACEs. Of the participants, 91% were black, 60% female, 24% uninsured or self-paid, 58% on Medicaid and/or Medicare, and 18% on commercial insurance. Responses showed 51% of patients were unemployed, 17% retired, 4% on disability, 21% non-Grady employees, and 4% Grady employed. At least 77% had hypertension, 41% DM, 14% CAD, 33% depression, 17% anxiety, and 39% had a disability. Preliminary statistical analysis showed an association between 4+ ACE score and depression (p-value <0.05).

CONCLUSIONS: Preliminary analyses suggest an association between 4+ ACE score and depression, a potential deterrent to follow-up completion. Upon continuing analysis, we expect to identify more associations between no-show rates and ACE score as well as other health conditions. These findings will be used to improve patient retention.

Comparison of Different Standoff Pads During Ocular Ultrasound Training Sessions

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BACKGROUND: Bedside ocular ultrasound is a fast, non-invasive, and cost-effective diagnostic tool. Ocular ultrasound typically involves large amounts of ultrasound gel placed over the eye to minimize pressure placed on the eye by the ultrasound probe. During training sessions, the eye being imaged must be changed frequently, so using large amounts of gel is messy and wasteful. In this study, we compared different standoff pad options during ocular ultrasound education sessions.

METHODS: Small groups of medical students practiced ocular ultrasound on standardized patients (SP) under direction of faculty members. There were 3 standoff pad options: gel placed over saran wrap, gelatin pads, and water-filled balloons. Each SP, student, and faculty completed a survey regarding their preference and the pros and cons of each option. They also rated the quality of the standoff pads on a 3-point Likert scale. The responses were then compiled and examined for common themes.

RESULTS: Out of 13 SPs, 6 (46%) favored gelatin pads, 4 (31%) gel, and 3 (23%) balloons. Out of 15 faculty, 11 (73%) favored gelatin pads, and 4 (27%) gel. Out of 104 students, 50 (48%) favored gel, 43 (41%) gelatin pads, and 10 (10%) balloons. Gelatin pad advantages were that it felt comfortable for the SPs, yielded clear images, and was quick, neat, and easy to use. However, it broke easily and had to be replaced often. Advantages of the gel were that it was comfortable for the SPs, easy to use, and yielded clear images. However, it was also messy and constantly slipped off. The balloon was noted as neat and interesting to use but yielded poor images and was difficult to maneuver probes with.

CONCLUSIONS: Overall, gelatin pads were most preferred, followed by gel. Given the desire to find a medium that is neat and easy to use, comfortable for SPs, and yields clear images, gelatin pads would likely be the best option for ocular ultrasound training sessions amongst these choices of standoff pads.

Development of an asynchronous learning module using ultrasound to demonstrate "living anatomy" of the ankle

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BACKGROUND: Medical schools employ numerous teaching modalities to better equip students for clinical practice. With the increased availability and utilization of handheld ultrasonography, more emphasis has been placed on ultrasound education. However, ultrasound education can be difficult to implement due to the logistical difficulties of hands-on instruction. One solution involves independent study; however, this solution lacks in-person faculty instruction. A compromise involves the development of an asynchronous ultrasound module aimed to provide students with an instructional guide that can be used at their own convenience in conjunction with a handheld ultrasound. Our asynchronous ankle ultrasound module aims to teach first year medical students about the basics of ultrasonography, reinforce ankle anatomy, and introduce clinically relevant cases.

METHODS: The development of the ankle ultrasound module involved the creation of ultrasound education resources that will be made available to students during their preclinical education. The module aims to demonstrate the "living anatomy" of the ankle by combining anatomical images, ultrasound, and other imaging modalities. The module also instructs students on proper use of handheld ultrasounds. A pre- and post-test survey will be given to students to determine the efficacy of the asynchronous module.

RESULTS: We have created an asynchronous ultrasound module that demonstrates ankle anatomy using ultrasound. Students can use this module on their own without the need for faculty oversight.

CONCLUSIONS: The utilization of asynchronous modules can be useful in medical education. We have created an asynchronous ankle ultrasound module that reinforces ankle anatomy and provides more exposure to ultrasonography.

Effectiveness of Asynchronous EKG Modules in Undergraduate Medical Education

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BACKGROUND: Interpretation of the electrocardiogram (EKG) is a crucial skill for physicians, yet many studies have demonstrated a lack of proficiency among residents of various medical specialties. Simultaneously, increasing emphasis is being placed on self-directed learning in undergraduate medical education. This project aims to explore the utility of an online, asynchronous EKG education course in improving medical student EKG interpretation skills.

METHODS: An online EKG course comprised of six modules covering basic electrocardiography topics was developed. Rising M2 through M4 classes were asked to voluntarily complete the course. Participants completed a pretest, posttest, and survey to assess changes in EKG interpretation abilities and attitudes about their previous EKG education experience and opinions of the asynchronous course.

RESULTS: 10 students have completed the course (M2 = 6, M3 = 3, and M4 = 1). Mean pretest score: 62%. Mean posttest score: 88%. Among survey responses: 60% strongly agreed and 40% agreed that this course was an effective format for EKG education and 70% strongly agreed that they would recommend the course to other medical students. 70% strongly agreed that they would refer back to this course in the future to refresh their EKG knowledge. Survey responses indicated multiple benefits of the format and a few areas that could be improved.

CONCLUSIONS: Posttest scores indicate improvement (26 percentage points) in EKG interpretation abilities among respondents. Survey responses suggest that incorporating asynchronous modules for EKG interpretation may improve learners' experiences in this area of study (e.g. directly addresses concerns regarding access to guided practice questions). Though this study is currently limited by its small sample size, initial data are promising with regards to the utility of asynchronous modules in EKG education.

Cost Analysis and Objective Validation of an Innovative Cadaveric Training Model for Internal Carotid Artery Injury Management in Endoscopic Skull Base Surgery

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BACKGROUND: Internal Carotid Artery Injury (ICAI) is a rare and life-threatening complication during endoscopic endonasal approaches (EEA). Perfusion based human cadaveric simulation training has been widely accepted as the gold paradigm for training of ICAI management due to its high anatomical realism. Although multiple studies have elucidated the validity and costs of the perfused-cadaver model, optimization of tradeoff between training validity and cost-effectiveness is yet to be explored.

METHODS: A cohort of 8 senior residents and clinical fellows was enrolled. A commercially available perfusion system of $12 was utilized to perfuse a blood substitute into the head. Each trainee attempted one trial of endoscopic control of an ICAI, which was followed by validated questionnaires. Time to hemostasis (TTH) and estimated blood loss (EBL) were trended. The questionnaire scores were then cross-validated to establish the feasibility of this new perfused-cadaver model.

RESULTS: The total cost of the simulation was $750, i.e. $107 per person. The average EBL and TTH for otolaryngology residents are 862 mL and 297 s whereas the average EBL and TTH for neurosurgery residents are 583 mL and 220 s. There were no significant differences between trainees of varying specialties. In addition, the reported average face validity was 4.85 ± 0.34, average content validity was 4.88 ± 0.39 and average curriculum validity was 5 ± 0. No significant differences were observed in these three described validities between cadaveric simulation of this study and an objectively validated perfusion-based cadaveric simulation.

CONCLUSIONS: This new cadaveric ICAI model with the commercially available perfusion system of $12 achieves high face, content and curriculum validity. The low cost presents an opportunity for the simulation to be broadly utilized not only in ICAI management training but also for standardized skull base simulation and potentially future EEA training curriculum.

Association of Androgen Deprivation Therapy with Metabolic Disease in Prostate Cancer Patients

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BACKGROUND: Androgen deprivation therapy (ADT), a backbone treatment for advanced prostate cancer (PC), has a variety of metabolic side effects. We conducted an updated meta-analysis to quantify the metabolic risks of ADT.

METHODS: We searched PubMed, Web of Science, and Scopus in May of 2022 for studies investigating the risk of metabolic syndrome (MetS), diabetes, and hypertension from ADT in PC patients using keywords. Only full-length studies with a control group of PC patients not on ADT were included. All results compatible with each outcome domain in each included study were sought. For included studies, relative risk (RR) was pooled using a random effects model and a trim-fill approach was used to adjust for publication bias.

RESULTS: Of 1,846 records screened 19 were found suitable for data extraction. Five studies (n= 891 patients) were evaluated for MetS as an outcome, with the random effects model showing a pooled RR of 1.60 ([95% Confidence Interval (CI), 1.06–2.42]; p=0.03) for patients on ADT while twelve studies (n= 336,330 patients) examined diabetes as an outcome, and the random effects model showed a RR of 1.43 ([95% CI, 1.28–1.59]; p< 0.01). After adjustment for publication bias, ADT was associated with a 25% increased risk for both MetS and diabetes. 4 studies (n=7,051 patients) examined hypertension as an outcome, and the random effects model showed a RR of 1.30 ([95% CI, 1.08–1.55]; p=0.18) in ADT patients.

CONCLUSIONS: ADT increased the risk of MetS and diabetes in patients with PC, although these associations were not as strong as previously reported. In our novel meta-analysis of hypertension, we found that ADT increased the risk of hypertension by 30%. These results should be understood in the context of collaborating care between a patient's oncologist and primary care provider to optimize care.

Novel Head and Neck Cancer Mouse Models: Can This Be the Key to the First Major Head and Neck SCC Treatment Advancement in 15 years?

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BACKGROUND: Head and neck squamous cell carcinoma (HNSCC) is the sixth most common cancer worldwide. Risk factors for human papillomavirus (HPV)-negative HNSCC include a history of tobacco use. Patients with locally advanced HPV-negative HNSCC have poor prognosis despite aggressive multimodal therapy, and the treatment paradigm has remained stagnant for >15 years. Preclinical models that recapitulate human HPV-negative HNSCC are essential to evaluate novel therapeutic approaches. Two molecular profiles seen in HPV-negative HNSCC include 1) loss of functional P53 and RB (*p53; Rb*) and 2) loss of functional P53 and expression of constitutively activated PIK3ca^{H1047R} (p53; *Pik3ca*).

METHODS: Tobacco carcinogen benzo[a]pyrene was applied to the oral mucosa of genetically engineered mouse models (GEMM) that exhibit the aforementioned molecular profiles (*p53; Rb* and *p53; PIK3ca*) in their oral mucosa, weekly for four weeks. Primary tumors, cervical lymph nodes, and lungs were harvested and formalin-fixed for histologic evaluation. Phenotypic characteristics of tumors and presence of lung/lymph node metastases were assessed.

RESULTS: Oral cavity tumors from both GEMMs exhibited high-grade squamous cell carcinoma. However, the *p53; Rb* GEMM had a greater propensity for metastasis to the cervical lymph nodes and lungs. Of the 95 HNSCC-bearing *p53; Rb* mice assessed, 25 (26.3%) displayed pulmonary metastases. By comparison, 9 (8.4%) of the 107 *p53; Pik3ca* mice exhibited pulmonary metastases.

CONCLUSIONS: Loss of *p53; Rb* was associated with higher propensity for regional and distant metastases in a murine model of HNSCC compared with the *p53; Pik3ca^{H1047R}* genotype. This knowledge can be used to better understand the natural disease progression of HPV-negative HNSCC and provide a preclinical platform for developing effective treatment strategies.

A Novel SYNJ1 Variant: One Step Closer to Understanding the Critical Protein and Its Importance In Neural Function

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BACKGROUND: *SYNJ1* encodes Synaptojanin-1, a dual-function poly-phosphoinositide phosphatase that is expressed in brain to regulate neuronal synaptic vesicle dynamics. Biallelic *SYNJ1* variants cause a spectrum of clinical manifestations, from early onset parkinsonism to developmental and epileptic encephalopathy.

METHODS: Proband-only exome sequencing was used to identify a homozygous *SYNJ1* pathogenic variant in an individual with epileptic encephalopathy. Sanger sequencing was used to confirm the variant.

RESULTS: We present an Afro-Caribbean female who developed uncontrollable seizures shortly after birth, accompanied by developmental delay and severe generalized dystonia. She had homozygosity for a novel c.242-2A>G variant in *SYNJ1* with both parents being heterozygous carriers. An older sister was reported to have had a similar presentation but was not examined. Both siblings died at approximately age 16 years.

CONCLUSIONS: We report a novel pathogenic variant in *SYNJ1* present in homozygosity leading to developmental and epileptic encephalopathy. Currently there are only 4 reports describing 10 individuals with *SYNJ1*-related developmental and epileptic encephalopathy. This case expands the clinical knowledge and the allelic heterogeneity associated with *SYNJ1* variants.

Erythroblastic Island Heme Synthesis under Normal and Inflammatory Conditions

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BACKGROUND: Anemia is the most prevalent of all erythroid disorders resulting from defective erythropoiesis. Anemia of chronic disease/inflammation (ACD) is a major contributor to the morbidity and mortality of chronic disorders including cancer, rheumatoid arthritis, and chronic kidney disease. Erythropoiesis occurs in erythroblastic islands in bone marrow, where erythroid cells surround a central nurse macrophage and share metabolites. Categorizing the specificity of the differentiation process as it occurs in erythroblastic islands and the interaction between developing erythroid cells and their nurse macrophages will result in a better understanding of erythropoiesis during inflammation and the pathophysiology of diverse anemias.

METHODS: Erythroblastic islands were generated using bone marrow-derived CD34+ cells genetically engineered via lentiviral vector transformation to produce an Mpl-based Cell Growth Switch (CGS). Cells were harvested at different stages of erythropoiesis and were subjected to single cell western blots to determine ALAS2, FECH, β-globin and OGDH protein levels, establishing a timeline for heme biosynthesis.

RESULTS: Flow cytometric data revealed that differentiation occurred in erythroblastic islands over 14 days based on the presence of CD235a, CD71, and CD206 positive cells probing glycophorin A, transferrin, and macrophages, respectively. GFP was used to tag cells expressing CGS. Of the total GFP+ cells, 12% were CD206+, 50% were CD71+ and 18% were CD235+ indicating that erythroid cells surrounded central macrophages.

CONCLUSIONS: Preliminary data suggests the production of in vitro erythroid islands supporting erythropoiesis without addition of exogenous cytokines. Future studies may probe the temporal release of metabolites by nurse macrophages that allow for the progression of erythropoiesis. Experiments assessing the LPS-induced upregulation of IRG1 and itaconate on heme production and cellular differentiation are in progress.

Diabetic foot osteomyelitis combinatorial labeling and spectral imaging: a protocol for sample collection

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BACKGROUND: Diabetes is the leading cause of lower extremity nontraumatic amputations in the United States and globally. Diabetic foot osteomyelitis is usually the final event preceding amputation. There is little data investigating the location and abundance of bacteria in osteomyelitis. Combinatorial labeling and spectral imaging is a promising and novel approach compared to conventional cultures. Currently, there are no data using this method for osteomyelitis and thus no protocols for sample collection and processing.

METHODS: Patients with diabetic foot osteomyelitis undergoing standard of care amputations at Grady Memorial Hospital were prospectively identified using the operating room schedule and by collaborating with the vascular, orthopedic, and podiatric surgery teams from June 2022 to July 2022. Verbal consent was obtained for bone sample collection, and the laboratory was notified about the incoming sample. The patient information was recorded into a secure database. In the operating room, the bone sample was collected in sterile fashion and aerobic and anaerobic cultures were obtained before placing the sample in fixing solution. The sample information was recorded, and the anatomical origin was noted on the sample collection diagram. The sample was then taken to the laboratory for analysis.

RESULTS: Bone samples from 2 patients undergoing amputations for diabetic foot osteomyelitis were obtained. A diagram including the bone anatomy of both left and right foot was found to be the most effective for correlating the anatomical origin of the bone sample collected. The cultures taken from the obtained bone samples correlated with the culture results from Grady. The bone samples are now being processed for combinatorial labeling and spectral imaging.

CONCLUSIONS: This protocol for bone sample collection is feasible and reproducible. Protocol implementation requires close collaboration with attending surgeons to obtain consent.

Image Quality and Diagnostic Performance of 1.16 Tesla Open MRI Scans in the Evaluation of Diseases of the Pelvis

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BACKGROUND: Many patients, particularly claustrophobic and obese patients, are unable to undergo pelvic magnetic resonance imaging (MRI) exams on conventional closed MR machines. High field open MR scanners, a novel technology, enables diagnosis of disease in such patients. However, to date, high field open MR machines have a magnet strength in the 1-1.2T range, lower than the conventional closed scanners used in practice today, which are typically 1.5 or 3.0T. The lower field strength of open MR machines raises concern about lesser image quality, and the possibility of missed diagnoses. The purpose of our novel study is to assess image quality and compare diagnostic accuracy of pelvic studies from an open high field scanner (1.16 T) to two closed scanners (1.5 T and 3.0 T).

METHODS: A retrospective chart review of patients who had undergone MR pelvic scans on both the open high field 1.16T MR scanner and either a 1.5T or 3.0T conventional closed MR machine between January of 2017 and June of 2022 was performed. Qualitative analysis will include review by 2 readers who will assess the image quality for evaluation of the uterus, ovaries, other organs, and pathologic findings on multiple MR sequences. Image quality assessment includes five qualitative image parameters scored on a 5-point scale. Quantitative image analysis includes determination of signal to noise (SNR) and contrast to noise ratios (CNR) on the 1.16T, 1.5T, and 3.0T scanners.

RESULTS & CONCLUSIONS: The research study including data analysis is ongoing. We suspect that image quality of the open scanner will be inferior to the closed scanners, but the ability to make accurate diagnoses will be equal. We predict the CNR and SNR will be greatest on the 3.0T scanner, with both the 1.5 and 3.0T scanners outperforming the 1.16T scanner.

Greater Trochanter Fractures of the Native Hip: Current Evaluation and Management at a Single Institution

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BACKGROUND: Hip fractures are classified in a variety of ways, depending on their location, severity, and type. Mortality rates for hip fractures are reported between 18%- 31% within a year of onset [1]. Isolated greater trochanter (GT) fractures represent a subset of hip fractures in which treatment algorithms can vary. Many are treated non-operatively via conservative measures. The decision for surgery is often based on advanced imaging with MRI providing the best insight to classify the fractures as either isolated, extending into the intertrochanteric (IT) line, or the femoral neck. Prophylactic fixation for those with the IT line or femoral neck extension may prevent further propagation of the injury that would otherwise occur due to normal weightbearing and motion of the hip joint [2]. Through this study, we evaluated if protocol was followed: 1) Do we need an MRI to diagnose the fracture? 2) How were decisions to follow conservative treatment made without the use of MRI? 3) For those who followed the non-operative route, would surgery have been better recommended, and vice versa?.

METHODS: Patients aged 25-68 presenting with isolated GT fractures were identified via billing codes from Grady Memorial Hospital between January 2016 and January 2022. Patient demographics, medical history, treatment plans, long term outcomes, and possible outcomes were assessed.

RESULTS: Of the 83 patients who were identified as having greater trochanter fractures, 18 qualified with isolated greater trochanter fractures. There were 5 operative patients with an average hospital length of stay (LOS) of 17.6 days compared to their non-operative counterparts who stayed 14.6 days in the hospital. Of the operative cases, 2 followed MRI protocol while 5 of the 13 non-operative cases used MRI.

CONCLUSIONS: These findings suggest that a MRI protocols for these specific fractures must be revisited to better reflect in-patient standards of practice and care. Further data points we would like to collect are time to healing, ambulatory status, frailty scores, and MRI analyses of the patients who had imaging studies. Preliminary data suggests further research through a prospective randomized control study is warranted.

Creating an Asynchronous Ultrasound Module for Medical Education

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BACKGROUND: The increasing use of point-of-care ultrasound at the bedside calls for increased medical education in the use of ultrasound imaging. However, the limited number of instructional hours and faculty availability make it difficult to incorporate ultrasound into medical education. Fortunately, portable ultrasound units provide medical students with a fast, hands-on method of engaging with "living anatomy" while studying the musculoskeletal system. We aim to create an asynchronous online module to circumvent the barriers to ultrasound education, while teaching medical students to use ultrasound to supplement their understanding of shoulder anatomy.

METHODS: To make the module useful to first-year medical students, we chose to have it heavily correlated with the shoulder anatomy curriculum at the Augusta University/University of Georgia (AU/UGA) Medical Partnership. In addition to studying the basic anatomy of the shoulder, we have included clinical cases that are likely to be encountered and imaged by ultrasound.

RESULTS: An asynchronous ultrasound module has been created that will demonstrate shoulder anatomy and clinical correlates using ultrasound.

CONCLUSIONS: We will offer the module to first-year medical students at the AU/UGA Medical Partnership who are learning musculoskeletal anatomy. Following the module, we will administer surveys to gather feedback on the module, perceived effectiveness of the module, and comparison with in-person ultrasound instruction.

Promoting Informed Decisions about Colorectal Cancer Screening in Older Adults: Retrospective Chart Review of a Cluster Randomized Trial

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BACKGROUND: For adults aged 76-85, guidelines recommend individualizing decision making about whether to continue colorectal cancer (CRC) screening. These conversations can be challenging as they need to consider a patient's CRC risk, overall life expectancy, and personal preferences. PRIMED (PRomoting InforMEd Decisions about Cancer Screening in Older Adults) was a Cluster Randomized Trial that aimed to promote shared decision making for CRC screening decisions amongst older adults. Physicians in the intervention arm of the trial received a 2-hour online course in Shared Decision Making (SDM) communication skills and received an electronic reminder of patients eligible for CRC screening discussions before upcoming visits. The comparator arm of the study received reminders only without SDM training. Following the PRIMED study, in a retrospective chart review, we quantified how often primary care physicians used SDM to communicate CRC screening options with patients and investigated key predictors of whether SDM was used in visits.

METHODS: Physician charts were analyzed using deductive and inductive content analysis to identify proxy variables for shared decision making. Some of these proxy variables included the number of CRC options discussed and whether pros and cons of CRC screening was mentioned. Two coders independently coded 500 charts from the PRIMED study. Cohen's Kappas were calculated to assess inter-rater reliability. If percent agreement was >70% between the two coders, discrepancies were resolved appropriately.

RESULTS & DISCUSSION: Data analysis is ongoing and is aimed at quantifying how often physicians used shared decision making to communicate CRC screening options with patients. The findings of this project will be used to create additional educational tools to promote shared decision making in the primary care setting.

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