

Degree: MPH-45

Field of Study: Clinical Effectiveness

Practicum Project Abstracts 2023

Project Title	Project Summary or Abstract
Estimated Increased Lifetime Cancer Risk From Computer Navigated Spine Surgery	<p><b>Objective</b></p> <p>(1) To determine the incremental increase in intraoperative ionizing radiation conferred by computed tomography (CT) as compared to conventional Xrays and fluoroscopy (2) To model different lifetime cancer risks contextualized by the intersection between age, sex, and intraoperative imaging modality.</p> <p><b>Summary of Background Data</b></p> <p>Intraoperative imaging to verify the safe placement of surgical implants is a core component of spine surgery. There are legacy mechanisms, including Xray radiographs and fluoroscopy, as well as modern modalities, including computed tomography (CT) to accomplish this. CT has inherent benefits including increased resolution and cross-sectional imaging, but has been shown to require higher doses of radiation. In order to better understand the cost-benefit proposition of intraoperative CT, it is important to understand the risk profile associated with increased radiation dosages.</p> <p><b>Methods</b></p> <p>Effective doses of intraoperative ionizing radiation were extracted from 610 adult patients who underwent single-level instrumented fusion for lumbar degenerative or isthmic spondylolisthesis from January 2015 through January 2022. Patients were divided into those who received intraoperative CT (n = 138) and those who underwent conventional intraoperative radiography (n = 472). Generalized linear modeling was utilized with intraoperative CT use as a primary predictor and patient demographics, disease characteristics, and preference-sensitive intraoperative considerations (e.g. surgical approach, surgical invasiveness) as covariates. The adjusted risk difference in radiation dose calculated from our regression analysis was used to prognosticate the associated cancer risk across age and sex strata.</p>

	<p>Results  (1) After adjusting for covariates, intraoperative CT was associated with 7.6 mSv (IQR 6.8–8.4 mSv; <math>P &lt; 0.001</math>) more radiation than conventional radiography. (2) For the median patient in our population (a 62-year-old female), intraoperative CT use increased lifetime cancer risk by 2.3 incidents (IQR 2.1–2.6) per 10,000. Similar projections for other age and sex strata were also appreciated.</p> <p>Conclusion  Intraoperative CT use significantly increased cancer risk compared to conventional intraoperative radiography for patients undergoing lumbar spinal fusions. As emerging technologies in spine surgery continue to proliferate and leverage intraoperative CT for cross-sectional imaging data, strategies must be developed by surgeons, institutions, and medical technology companies to mitigate long-term cancer risks.</p>
<p>Evaluation of the Massachusetts Seven Day Opioid Duration Limit Law Among Post-Operative Orthopedic Patients</p>	<p>As a fellow in the Department of Population Medicine, I collaborated with my mentors Drs. Hefei Wen and Frank Wharam to design and lead a quasi-experimental study evaluating the impact of a 2016 Massachusetts opioid prescribing limit law on opioid prescribing among post-operative orthopedic patients. Using a cross-sectional, comparative interrupted time series design, we found a reduction in the proportion of fills greater than 7-days duration among Massachusetts relative to New Hampshire post-operative orthopedic patients. These findings are important for state policymakers interested in striking a balance between reducing opioid prescribing while ensuring adequate post-operative pain control.</p>
<p>Effect of Microfinance Interventions on Intimate Partner Violence: A Systematic Review and Meta-Analysis of Randomized Controlled Trials</p>	<p>Poverty is a risk factor for intimate partner violence (IPV), and economic empowerment programs may reduce violence. We conducted a systematic review and meta-analysis to evaluate whether microfinance interventions are associated with a reduction in the various forms of IPV.</p> <p>We searched multiple databases for randomized controlled trials (RCTs) evaluating the effect of microfinance interventions vs. control on exposure to IPV. We evaluated overall IPV and four WHO-designated domains: physical IPV, psychological/emotional IPV, sexual IPV, and controlling behaviors. Authors independently assessed study eligibility, extracted pre-specified data, and evaluated risk of bias using the Cochrane Risk of Bias tool. We conducted univariate meta-analyses using a random</p>

	<p>effects model to calculate effect sizes and 95% confidence intervals for each IPV outcome. GRADE methodology was used to rate the certainty of findings.</p>
<p>The Hidden Costs of Trauma: Financial toxicity and Long-term Patient Reported Outcomes in Trauma Survivors</p>	<p>This project was part of the Functional Outcomes and Recovery after Trauma Emergencies (FORTE) project, a prospective cohort study involving level 1 trauma patients in the Boston metro area with moderate to severe injuries. The purpose was to identify the rate of and understand the experience of financial toxicity in moderate to severely injured trauma patients in 3 Boston Level-1 trauma centers and to determine the relationship between financial toxicity and long-term patient-reported mental and physical health outcomes.</p>
<p>STEMI Activation via Smartphone Application: Improving Timing and Accuracy of Care</p>	<p>ST-Elevation Myocardial Infarction (STEMI) management requires efficient communication and collaboration to ensure timely care. Guidelines recommend that patients presenting to a Percutaneous Coronary Intervention (PCI) capable centre receive care within 90 minutes and those presenting to non-PCI capable centres receive care within 120 minutes. Those receiving care beyond this time thresholds have increased morbidity and mortality. However, achieving timely care can be challenging, especially for patients in rural &amp; remote areas with limited resources.</p> <p>Our team conducted a multi-center, before-and-after observational study between January 2020 and December 2020 for hospitals that refer STEMI patients to Hamilton Health Sciences for PCI. Emergency medicine physicians at three community hospitals (intervention group) were provided a secure smartphone application for STEMI activation in April 2020. Emergency medicine physicians at ten similar and equidistant community hospitals (control group) used the usual model of telephone and fax for STEMI activation. Outcomes of interest included time from diagnostic ECG to ambulance departure and rates of false activation. These were compared before-and-after the implementation of the intervention in both groups.</p> <p>A total of 267 STEMI activations occurred during the study period. Our study confirms high need, feasibility, usability, usage, and user satisfaction of the smartphone application. There was also a trend towards improvement in timing of care and rates of false activation. The pilot results were used to secure a large operational grant to support a larger, adequately powered trial, which is currently</p>

	<p>underway. This smartphone application offers a cheap, simple, easy-to-use, point-of-care, scalable tool to improve STEMI activation.</p>
<p>Revisiting the Pediatric Injury Pyramid: The burden of pediatric and adolescent injuries in 2020</p>	<p>The aim of Injury remains the leading cause of death in children and adolescents in the United States . As such, pediatric injuries account for emergency department (ED) visits and hospitalizations. Trends in both fatal and non-fatal injuries have changed in the last decade since the modern pediatric injury pyramid was published. Recent data suggested for the first time, firearm mortality had overtaken motor vehicle crash (MVC) mortality in the pediatric population age 1-19 .</p> <p>The pediatric injury pyramid creates a visual representation of the distribution of injuries results in ED visits, hospitalizations or deaths. The pediatric injury pyramid was first described in the 1930s and has been developed in multiple iterations to represent the changing burden of injury on the healthcare system.</p> <p>The goal of this study was to describe the recent changes in injury patterns and trends in children and adolescents age 0—19 to better understand the changes in rates of injuries requiring ED visits, hospitalization or resulting in death. National data available from 2020 will be used to construct this update.</p>
<p>Rheumatoid arthritis, quantitative parenchymal lung features, and mortality among smokers</p>	<p>Rationale: There have been limited investigations of the prevalence and mortality impact of quantitative computed tomography (QCT) parenchymal lung features in rheumatoid arthritis (RA).</p> <p>Objectives: Determine the cross-sectional prevalence and mortality associations of QCT features, comparing RA and non-RA participants.</p> <p>Methods: We identified participants with and without RA in COPDGene, a multicenter cohort study of current or former smokers. Using a k-nearest neighbor quantifier, high resolution CT chest scans were scored for percentage of normal lung, interstitial changes, and emphysema. We examined associations between QCT features and RA using multivariable linear regression. After dichotomizing participants at the 75th percentile for each QCT feature among non-RA participants, we investigated mortality associations by RA/non-RA status and quartile 4 vs. quartiles 1-3 of QCT features using Cox</p>

	<p>regression. We assessed for statistical interactions between RA and QCT features.</p> <p>Measurements and Main Results: We identified 82 RA cases and 8820 non-RA comparators. In multivariable linear regression, RA was associated with higher percentage of interstitial changes (<math>\beta=1.7 \pm 0.5</math>, <math>p=0.0008</math>) but not emphysema (<math>\beta=1.3 \pm 1.7</math>, <math>p=0.44</math>). Participants with RA and &gt; 75th percentile of emphysema had significantly higher mortality than non-RA participants (HR 5.86, 95%CI 3.75-9.13) as well as RA participants (HR 5.56, 95%CI 2.71-11.38) with <math>\leq</math> 75th percentile of emphysema. There were statistical interactions between RA and emphysema for mortality (multiplicative <math>p=0.014</math>; attributable proportion 0.53, 95%CI 0.30-0.70).</p> <p>Conclusions: Using machine learning-derived QCT data in a cohort of smokers, RA was associated with higher percentage of interstitial changes. The combination of RA and emphysema conferred greater than 5-fold higher mortality.</p>
<p>Inequities in Access to Virtual Visits within Hematology during the COVID-19 Pandemic</p>	<p>The COVID-19 pandemic prompted an expedited shift towards expanding telemedicine services. Historically, telemedicine has been shown to increase healthcare access for those in rural communities but widen care gaps for other vulnerable populations by exacerbating existing digital divides and clinician biases in offering telemedicine services. The purpose of this study is to understand the demographic and socioeconomic characteristics of patients completing telephone, video, and in-person visits at the Brigham and Women's Hospital Division of Hematology (BWH DOH) during the COVID-19 pandemic.</p> <p>This is a retrospective chart review of patients who completed clinical encounters within the BWH DOH between March 19, 2020, when the division switched to virtual visits, and December 31st, 2020 (pandemic). Patients who completed visits between January 1, 2019 and March 18, 2020 (pre-pandemic) served as a comparator group. Differences in socio-demographic composition of patients completing telephone only (TO), video only (VO), or a mix of in-person and telemedicine visits (IPTM) will be tested for significance using Kruskal-Wallis and Chi-square tests. Multivariable regression modeling will be used to compare VO to TO visit use within demographic categories and reported as adjusted odds ratios (aOR).</p>

<p>Predictors of Doxycycline acceptance as post-exposure prophylaxis against bacterial STIs in gay, bi-sexual and other men who have sex with men</p>	<p>Through this study we hope to determine factors associated with acceptance of doxycycline as a post-exposure prophylaxis (PEP) against bacterial STIs (Gonorrhoea, Chlamydia and Syphilis) in at-risk populations including gay, bi-sexual and other men who have sex with men (gbMSM).</p>
<p>Analyzing dynamic trends of HIV prevalence among pregnant women in Botswana – a high risk group</p>	<p>My practicum research was a cross-sectional study using a large research database to look at HIV prevalence among pregnant women in Botswana. I analyzed data from over 120,000 antenatal records of women who delivered at eight government hospitals in Botswana between 2015 and 2019. We found that overall, the prevalence of HIV infection among pregnant women was decreasing with time and was 24.1%, with prevalence varying by site of delivery and increasing with age. Women with lower educational attainment, who were unmarried, and who had had multiple pregnancies were more likely to be HIV positive. While the overall prevalence of HIV infection decreased linearly from 2015 to 2019, the greatest declines were seen in women aged 25-39. We found a minimal decline in those aged 15-24, who are at particularly high risk of HIV acquisition. Our study suggested that preventative interventions such as pre-exposure prophylaxis (PrEP) should be prioritized during and immediately after the first pregnancy for young women in Botswana.</p>
<p>Real-world COVID-19 vaccine effectiveness against SARS-CoV-2 infection during the Omicron variant predominant among Thai adolescents aged 12-18 years</p>	<p>Background:  In Thailand, BNT162b2 vaccines for adolescents were introduced through the school-based program in August 2021 for the primary vaccination and in March 2022 for the booster. However, the Omicron variant emerged in early 2022. Therefore, vaccine effectiveness (VE) has raised questions.</p> <p>Methods:  A test-negative case-control design was used to estimate VE against SARS-CoV2 infection in adolescents aged 12 to 18 years in the Eastern region of Thailand. The RT-PCR test and vaccination history were retrieved from the National data registry system. Each case was matched with controls to the specimen collection date and site. A conditional logistic regression was performed to calculate VE.</p> <p>Results:</p>

	<p>From January to June 2022, 7700 adolescents (3758 detected and 4012 undetected RT-PCR results) were reported, and 4920 adolescents eligible for test-negative controls were identified. At the time of the RT-PCR test, 684 (14%), 295 (6%), 3834 (78%), 104 (2%), and three adolescents had received no, one, two, three, and four doses of COVID-19 vaccines, respectively. The most common regimen for primary vaccination was two doses of BNT162b2 (90%). The median(IQR) interval from the last vaccination to RT-PCR was 101 (63-112) days. The VE (95%CI) of BNT162b2 against the Omicron infection was 22% (7-34%), 19% (-16-48%), and 31% (10-46%) among adolescents aged 12-18, 12-15 and 15-18, respectively.</p> <p>Conclusion:</p> <p>Among adolescents, VE against confirmed COVID-19 infection (the Omicron variants) after two doses of Pfizer-BioNTech more than three months was 22% (95%CI 7-34%), which was comparable to other studies.</p>
<p>Real-world COVID-19 vaccine effectiveness against SARS-CoV-2 infection during the Omicron variant predominant among Thai adolescents aged 12-18 years</p>	<p>Background:</p> <p>In Thailand, BNT162b2 vaccines for adolescents were introduced through the school-based program in August 2021 for the primary vaccination and in March 2022 for the booster. However, the Omicron variant emerged in early 2022. Therefore, vaccine effectiveness (VE) has raised questions.</p> <p>Methods:</p> <p>A test-negative case-control design was used to estimate VE against SARS-CoV2 infection in adolescents aged 12 to 18 years in the Eastern region of Thailand. The RT-PCR test and vaccination history were retrieved from the National data registry system. Each case was matched with controls to the specimen collection date and site. A conditional logistic regression was performed to calculate VE.</p> <p>Results:</p> <p>From January to June 2022, 7700 adolescents (3758 detected and 4012 undetected RT-PCR results) were reported, and 4920 adolescents eligible for test-negative controls were identified. At the time of the RT-PCR test, 684 (14%), 295 (6%), 3834 (78%), 104 (2%), and three adolescents had received no, one, two, three, and four doses of COVID-19 vaccines, respectively. The most common regimen for primary vaccination was two doses of BNT162b2 (90%). The median(IQR) interval from the last vaccination to RT-PCR was 101 (63-112) days. The VE (95%CI) of BNT162b2 against the Omicron</p>

	<p>infection was 22% (7-34%), 19% (-16-48%), and 31% (10-46%) among adolescents aged 12-18, 12-15 and 15-18, respectively.</p> <p>Conclusion:</p> <p>Among adolescents, VE against confirmed COVID-19 infection (the Omicron variants) after two doses of Pfizer-BioNTech more than three months was 22% (95%CI 7-34%), which was comparable to other studies.</p>
<p>Surgical Burden of Disease and Delays in Surgical Care in Rural Chiapas, Mexico</p>	<p>Introduction</p> <p>Chiapas is the poorest Mexican state with shortages of medical personnel and limited access to timely surgery. We evaluated the burden of surgical disease as well as access and costs of care in collaboration with Compañeros en Salud (CES).</p> <p>Methods</p> <p>10 CES-trained community health workers administered a comprehensive household survey including components of the Surgeon OverSeas Assessment of Surgical Need, 3-delays model, and Financial Risk Protection Survey throughout 10 communities in rural Chiapas May-December 2021.</p> <p>Results</p> <p>Among 1658 households surveyed (70.3% total households), 229 operations were reported within the past 5 years. 23.0% of patients reached the hospital where surgery was performed in <math>\leq 2</math> hours. Patients requiring urgent operation reported median 2 (IQR 20), 2 (14.5), and 2 (15) days while those requiring elective operation reported a median 2 (IQR 7), 2 (9.5), and 2 (6.5) days to seek, reach, and receive care, respectively. Appendectomy was the most common operation (n=47), followed by cholecystectomy (30) and c-section (30). Median reported annual income was \$2,788.01 (IQR \$4,182.02) USD, and surgery cost \$497.86 (IQR \$1,145.08). 51.9% relied on loans or sale of personal objects to cover costs related to surgical care.</p> <p>Discussion</p> <p>This study shows poor access to timely operation compared to the target 80% from the Lancet Commission on Global Surgery. Substantial delays exist in seeking, reaching, and receiving surgical</p>



	<p>care, with high risk of catastrophic expenditures. These findings highlight the need for resource allocation to improve access to timely surgery within Chiapas.</p>
<p>Predicting patient-reported disability among older patients after non-cardiac surgery</p>	<p>Background: Older adults are a high risk surgical population. Disability-related outcomes, such as postoperative function or discharge home, are a top priority outcome for older patients considering surgery. Perioperative risk prediction tools often do not address these outcomes. Accurate prognostication of postoperative function in older surgical patients may help guide informed decision making for patients and families.</p> <p>Methods: We conducted a retrospective cohort study using 90-day follow up data from a multi-centre, prospective cohort study in Ontario, Canada. Adults <math>\geq 65</math> undergoing elective, non-cardiac surgery were included. The primary outcome was WHODAS 2.0 patient-reported disability 90 days postoperatively. We derived a multivariable prediction model using ordinary least squares regression. Predictors were pre-specified to reflect guideline-based best practice preoperative assessment of older patients. Internal model validation was conducted using 5000 bootstrap replicates created with replacement. Predictive performance was measured using R<sup>2</sup>, RMSE, MAE, and calibration. Sensitivity analyses were performed using single imputation for variables missing <math>&gt;1\%</math> data.</p> <p>Results: 577 participants were included in complete case analysis. Derivation dataset demonstrated low to moderate predictive accuracy (R<sup>2</sup>=0.3, RMSE=16.6, MAE=1.3). Validation dataset demonstrated comparable performance metrics (R<sup>2</sup>=0.24, RMSE=17.4). Calibration was similar between derivation and validation datasets. Predictive accuracy metrics using imputed data were similar to complete case analysis.</p> <p>Conclusion: Standard information obtained from best practice preoperative assessments appears to provide limited ability to accurately predict 90-day postoperative disability among older adults having elective, non-cardiac surgery. Future studies with larger sample sizes are required to examine more sophisticated models and explore additional pertinent preoperative predictors of disability.</p>
<p>OPTIMIZING ADMINISTRATION OF</p>	<p>This practicum project designed using quality improvement methodology, and results were presented using run charts. It was carried out at a large tertiary public hospital system in Ontario, Canada,</p>

<p>APPROPRIATE ANTIMICROBIAL PROPHYLAXIS FOR SURGICAL PATIENTS AT HAMILTON HEALTH SCIENCES</p>	<p>where over 16,500 surgical cases are performed annually. Local data collected via the NSQIP database was used to track the type and timing of antimicrobial prophylaxis administration prior to surgeries occurring in the organization at baseline, and as quality improvement interventions were implemented, in order to determine if the intervention was resulting in optimized antimicrobial administration and in improved surgical site infection rates across the organization. Despite the barriers to implementation that were presented by pre-existing organizational processes and by the pandemic, significant improvements in surgical site infection rates and in the rates of appropriate antimicrobial prophylaxis were seen following implementation of a series of interventions, including the implementation of antimicrobial push administration to replace minibag implementation, and the implementation of a standard Penicillin Allergy Review Record to differentiate likely IgE-mediated allergies from adverse reactions.</p>
<p>Trends in ADHD Medication (Stimulant and non-stimulant) Use in the United States from 2004 to 2022</p>	<p>Stimulants are used to treat Attention Deficit Hyperactivity Disorder (ADHD). About 16 million adults and 2.8 million children use stimulants annually. The aim of this study was to estimate the trends of prescribed stimulants from 2004 to 2022.</p> <p>Data was obtained from Optum Clinformatics from January 2004 to March 2022. We identified pharmacy dispensing of prescribed stimulants (amphetamine, dextroamphetamine, lisdexamphetamine, methamphetamine, methylphenidate) and non-stimulants (diethylpropion, modafinil, pemoline, phentermine, guanfacine), among US commercially insured individuals aged 6 to 64 years of age. We included enrollees who resided in all 50 states, with at least 28 days of continuous enrollment in at least one calendar month). We excluded individuals ages &lt; 6 years and &gt; 65 years, and non-ADHD Schedule III amphetamines.</p> <p>We stratified the data by region, sex, and age. The most commonly dispensed drug categories were schedule II stimulants followed by schedule III stimulants, and guanfacine. In children, the most used stimulant was methylphenidate compared to dextroamphetamine/amphetamine in adults. Stimulant utilization was higher in adult females compared to adult males, however, in children utilization was higher in males compared to females. Stimulant utilization was the highest for adults in the northeast and southern regions, and for children in the south and midwest regions.</p>

	<p>The use of ADHD medications, especially stimulants, continues to increase and should be monitored. Potential reasons for the increase in the number of prescriptions are multifactorial such as an increase in recognition, ADHD diagnosis and easier access to mental health care.</p>
<p>Care Management Impact on Spending and Utilization in a Medicaid ACO</p>	<p>States are experimenting with accountable care organization (ACO) contracts to slow Medicaid spending growth. There is limited information on the spending impact of ACOs within the younger, more behaviorally complex and healthier Medicaid population, compared to data from the Medicare ACO population. Using information from the largest Massachusetts Medicaid ACO (n=155,962 total beneficiaries) and exploiting the staggered program entry, we examined spending and clinical event rates of those having started and not yet started an integrated care management program among those identified as having high risk for future spending. Between 2016-21, 2,479 high-risk beneficiaries entered the program. Participation in the program for greater than seven months was associated with \$243 less in monthly spending compared with similar beneficiaries who had not yet started the program (95% CI \$-479, -\$6). For those receiving CMP care, there were 0.039 fewer ED visits per month (95% CI -0.05 to -0.028) and 0.012 fewer admissions per month (95% CI -0.017, -0.007) compared to those not yet started entered CMP. These both represent 30% reductions in utilization.</p>
<p>Relative lymphocytopenia in intracranial hemorrhage is associated with in-hospital infections</p>	<p><b>Background &amp; Purpose</b>  Absolute lymphocytopenia on admission has been associated with infectious complications and poor outcomes following intracranial hemorrhage (ICH). It remains unclear whether relative lymphocytopenia on admission (RLOA), as a surrogate marker for immune responsive, is also associated with infectious risk during hospitalization. This study investigates the relationship between RLOA and in-hospital infections among patients with spontaneous ICH.</p> <p><b>Methods</b>  This is a single center, retrospective analysis of consecutive patients with non-traumatic ICH admitted to the neurocritical care unit between 2008 and 2018. Clinical, demographic, laboratory, and radiologic data were extracted from patient charts. RLOA was defined as relative lymphocyte count less than 18%. Infection was defined as clinical diagnosis of pneumonia, urinary tract infection (UTI) or bacteremia during hospital stay. Chi-square test and Wilcoxon rank-sum tests were used to</p>

	<p>describe outcomes as appropriate. Logistic regression controlling for age, sex, Glasgow Coma Scale (GCS), ICH volume and intraventricular hemorrhage (IVH) and RLOA was constructed to estimate associations with infectious complications.</p> <p>Results</p> <p>441 patients with mean age of 71 years (<math>\pm 0.73</math>) and 54% males were included in the study. The prevalence of RLOA was 67% and the most frequent infection was UTI (18.5 %). Patients with RLOA had higher median ICH scores (2, IQR [1-3] vs. 1 IQR [0-1], <math>p &lt; 0.01</math>) and lower median GCS scores (13, IQR [8-15] vs. 15 IQR [14-15], <math>p &lt; 0.01</math>) compared to those without RLOA. Patients with RLOA had a higher incidence of in-hospital infection (34% vs. 22%; <math>p = 0.02</math>) than those without RLOA. RLOA was associated with in-hospital infection when adjusting for age, sex, ICH volume, IVH and GCS (OR 2.09 95% CI [1.19-3.66] <math>p = 0.01</math>).</p> <p>Conclusions</p> <p>RLOA was associated with in-hospital infections, suggesting that the presence of RLOA may predispose patients to infection and also serve as a surrogate marker for infectious risk after ICH.</p>
<p>Physical and Chemical Restraint in Hospitalized Children with Autism Spectrum Disorder</p>	<p>Background:</p> <p>Children with ASD have high rates of co-occurring psychiatric disorders, are hospitalized more than children without ASD and have longer lengths of stay. Little is known about the use of involuntary physical or chemical restraint in hospitalized children with ASD.</p> <p>Objective/Hypothesis:</p> <p>To compare the use of involuntary physical and chemical restraint due to behavioral dysregulation during inpatient pediatric hospitalization in children with ASD compared to children without ASD.</p> <p>Methodology:</p> <p>We designed a retrospective cohort study examining electronic health records of all patients aged 5-21 admitted to any inpatient pediatric medical unit at a large urban hospital over 5 years. Children were classified as having ASD if a billing diagnosis of ASD was associated with their inpatient hospital encounter and classified as having involuntary restraint if at least one order for Restraint for Violent or Self-Destructive Behavior was associated with at least one hospital encounter during the study period. Propensity score matching was used to ensure equivalence between ASD and matched non-ASD groups on age, number of hospitalizations, sex, race/ethnicity, primary language, and year of</p>

	<p>admission. Logistic regression was performed to determine the odds of restraint in children with ASD compared with children without ASD, controlling for age, reason for admission (behavioral health vs. medical), length of stay, and the presence of any mental health, developmental, or behavioral disorder.</p> <p>Results:</p> <p>In the sample of 21,275 hospitalized children, 366 children (1.7%) experienced restraint and 2027 children (9.5%) had ASD. Demographic information, prevalence of ASD, year and number of hospitalizations in the total sample and matched ASD and non-ASD groups are shown in Table 1. After adjusting for reason for admission, length of stay, and presence of mental health, developmental, and behavioral disorders, children with ASD were significantly more likely to be involuntarily restrained than children without ASD (Odds Ratio = 2.581, 95% CI= 1.820-2.662; <math>p &lt; .001</math>).</p> <p>Conclusions:</p> <p>Children with ASD have significantly higher odds of experiencing involuntary physical or chemical restraint for behavioral dysregulation compared to children without ASD during inpatient pediatric hospitalization, even after accounting for hospitalization features and co-occurring diagnoses. Work is needed to modify the hospital environment for children with ASD to reduce behavioral dysregulation and restraint.</p>
<p>A Propensity Score Analysis of Wound Complications following Revision Total Knee Arthroscopy (rTKA) with Concurrent Flap Coverage</p>	<p>Background: Despite advancements in total knee arthroplasty, devastating wound complications still occur and require revisions. For complex wounds, soft tissue flap coverage has been established as a valuable reconstructive option improving patients' reported outcomes and knee total range of motion. The purpose of this study is to analyze wound complications following flap coverage for revision total knee arthroplasties(rTKA) on the national level.</p> <p>Methods: Patients who underwent rTKA from 2012-2020 were identified in the NSQIP database. The cohort was divided into patients who underwent rTKA with a pedicled or free flap and those who did not receive a flap. A propensity score was generated from patients' baseline characteristics. A multivariable logistic regression model adjusting for propensity scoring was then constructed to assess differences in clinical outcomes.</p> <p>Results: rTKA was performed in 33,922 encounters, 104 of which utilized a flap. Patients who received flaps had poorer preoperative functional status, higher frailty scores, and were more likely</p>

	<p>to have their surgical wound classified as contaminated or dirty/infected. Flap coverage was associated with lower odds of wound dehiscence(OR 0.24, 95% CI 0.08-0.77, p=0.016) and higher odds of wound infection(OR 3.27, 95% CI 1.5-7.12, p=0.003).</p> <p>Conclusion: Soft tissue flap coverage is used more often in the setting of large and infected wounds following TKA. Our study's findings evidenced higher wound infection rates among patients who underwent flap coverage, likely attributable to the complexity of the wounds being treated. Thus, patients undergoing rTKA due to infection may receive treatment to optimize wound conditions before flap placement.</p>
<p>Associations Between MMP-2, Incident Heart Failure and Heart Failure Subtypes: the ARIC Study</p>	<p>The enzyme MMP-2 participates in extracellular matrix regulation and may be involved in heart failure (HF) pathogenesis. The objective of this study was to evaluate the relationships of circulating MMP-2 levels with HF risk. Among 4693 participants without prevalent HF (mean age of 75 years; 42% women), Cox proportional hazards regression models were used to estimate associations of plasma MMP-2 levels with incident HF, HF with preserved ejection fraction (HFpEF) and HF with reduced ejection fraction (HFrEF). Linear regression models were used to assess associations between MMP-2 and echocardiographic measures of cardiac structure and function. All Cox and linear models included demographic characteristics and HF risk factors. Over a mean follow-up of 6.4 years, 459 participants developed HF (214 HFpEF, 186 HFrEF). Compared to the lowest three quartiles, the highest quartile of MMP-2 levels was independently associated with a higher risk of incident HF overall (adjusted HR [95% CI]: 1.48 [1.21-1.81]), incident HFpEF (adjusted HR [95% CI]: 1.44 [1.07-1.94]) and incident HFrEF (adjusted HR [95% CI]: 1.48 [1.08-2.02]). Higher MMP-2 levels associated cross-sectionally with larger left ventricular (LV) end-diastolic volume index, greater LV mass index, higher E/e' ratio, larger left atrial (LA) volume index and worse LA reservoir and contractile strains (P &lt; 0.001 for all).</p>
<p>Challenges of Hepatitis B Treatment in Rural Sub-Saharan Africa: Treatment Initiation and Outcomes from a Public Hospital-</p>	<p>Background</p> <p>Despite a high prevalence, there are few successful models for de-centralizing diagnosis and treatment of chronic hepatitis B virus (HBV) infection among rural communities in sub-Saharan Africa. We report baseline characteristics and one-year retention outcomes for patients enrolled in a HBV clinic integrated within chronic disease services in a rural district hospital in Sierra Leone.</p> <p>Methods</p>

Based Clinic in Kono, Sierra Leone	<p>We conducted a retrospective cohort study of patients with HBV infection enrolled between April 30th 2019 and April 30th 2021. Patients were eligible for one-year follow-up if enrolled before February 28, 2020. Treatment eligibility at baseline was defined as cirrhosis (diagnosed by clinical criteria of decompensated cirrhosis, ultrasonographic findings, or aspartate-aminotransferase-to-platelet ratio &gt; 2) or co-infection with HIV or HCV. Retention in care was defined as a documented follow-up visit at least one year after enrollment.</p> <p>Results</p> <p>We enrolled 623 individuals in care, median age of 30 years (IQR 23-40). Of 617 patients with available data, 97 (15.7%) had cirrhosis. Treatment was indicated among 113 (18.3%) patients, and initiated among 74 (65.5%). Of 39 patients eligible for one-year follow-up on treatment at baseline, 20 (51.3%) were retained at one year, among whom 12 (60.0%) had documented viral suppression. Among the 232 patients not initiated on treatment eligible for one-year follow-up 75 (32.3%) were retained at one year.</p> <p>Conclusion</p> <p>Although further interventions are required to improve outcomes, our findings demonstrated feasibility of retention and treatment of patients with HBV infection in a rural district in Sub-Saharan Africa, when integrated with other chronic disease services.</p>
------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------