Nneoma Obiejemba  

**Asthma as a comorbidity in adult patients receiving treatment for back pain in an emergency department, ambulatory surgery and inpatient setting at a large, inner city, municipal New York hospital.**

Rationale: As pain can exacerbate asthma, we hypothesize that people with back pain and asthma experience exacerbation of asthma during flare of back pain. Men and women equally suffer from back pain. Whether sex and age influence the co-occurrence of asthma and back pain has not been determined.

Method: This was a cross sectional study using secondary data. Adults who presented to Kings County Hospital from October 1st 2015 to March 17th 2017 with ICD-10 codes for the diagnosis of low back pain, cervicalgia, lumbago with sciatica, radiculopathy, sciatica, dorsalgie and asthma were included in the analysis. Patients were categorized by location of treatment: Inpatient (IP), Emergency Department (ER), and Ambulatory Surgery (AS).

Analysis of data using Stata Version 14. Univariate, bivariate, and multivariate analyses were conducted.

Results: The mean age of the study population was 46 yrs +/-5, while the median was 47 years. The occurrence of asthma with back pain was 2% (404). Of this, 274 (68%) were females and 130 (32%) were males (P <0.001). Age was not significantly associated with the co-occurrence of asthma and back pain. After adjusting for sex, age, medical condition, and location of treatment. Males were 36% less likely to present with asthma and back pain when compared to females (OR 0.64 (95% CI: 0.51 to 0.79), P<0.001. There was no association between asthma and back pain. Patients were 20% less likely to be treated for asthma and back pain in the ER compared to AS. Patients were 4 times more likely to be treated for asthma and back pain in IP compared to AS.

Discussion: Our study showed that females were more likely to present with a co-occurrence of asthma and back pain than males in acute care hospital settings. A better understanding of the characteristics of pain and its influence on co-existing conditions such as asthma and back pain will help inform approaches for managing persons presenting to the hospital.

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Shumaila Khan  

**Association of global trends of national tobacco smoking rates with prevalence of pediatric asthma and allergy.**

Rationale: As there is a global decline in tobacco smoke prevalence, the rates of allergic diseases are increasing. Interestingly, tobacco exposure increases T-regulatory activity in murine models, which may suppress allergic responses. We determined whether there is an association between change in national tobacco smoking prevalence and change in childhood asthma and allergy throughout the world.

Methods: We compared the prevalence of asthma, allergic rhino-conjunctivitis and eczema results from phase I and phase III of the ISAAC study in children ages 6-7 and 13-14 with concurrent WHO tobacco prevalence for each ISAAC nation (n= 55), with an average of 7.2-year interval between ISAAC phase study. Change in raw prevalence’s were determined. Statistical analysis was done using the Spearman correlation coefficients.

Results: Tobacco rates between year1 (Phase I) and year2 (Phase III) were 2% (SD=2.6) lower on average. There was a significant positive correlation between the change in tobacco rate and asthma prevalence in the 13-14-year group (p=0.02) but not the 6-7-year group (p=0.6). There was a significant negative correlation between change tobacco rate and change in eczema 6-7-year group (p=0.047) but not 13-14-year group (p=0.41).

Conclusion: While decrease in tobacco smoking may decrease airway asthma responses, it may also increase eczema, possibly due to decrease in tobacco-mediated immune suppression.
Discordant Perspectives: Barriers to End of Life discussions in urban underserved populations

Advance Directives (AD) and Health Care Proxies (HCP) enable physicians to provide treatment concordant with patients' wishes. A retrospective chart review of patients aged 65 years and older at a primary care clinic in Central Brooklyn showed a discussion rate of 37.5% for either AD or HCP. We sought to understand barriers to advance care planning in our practice.

We distributed a survey assessing awareness and interest in advance care planning in 266 patients. Of these, 30% completed the survey. 41 physicians received an electronic survey and 63% responded. Respondents used a Likert scale to rate the following for end-of-life (EOL) care: family input, independence, dignity, freedom from or reduction of pain and suffering, living as long as possible and cost of health care.

Patients and providers thought it was important to have EOL wishes in writing (86% and 96% respectively), yet only 24% of patients had heard of “Advance Directives". 83% of patients were interested in discussing EOL care while 42% of physicians weren’t. More than 70% of patients selected “living as long as possible”, “cost of healthcare” and “family input” as very important. Adversely, 4% of physicians considered “living as long as possible”, and less than 25% of physicians considered “cost of healthcare” and “family input” as very important. More than 70% of physicians rated dignity, independence, and freedom from suffering as very important.

Despite not knowing the term, most patients want AD. Physicians’ values contrast markedly with patients’ about EOL care. Physician disinterest in having their own EOL conversations imply bias against conversations with patients. Accepting different perspectives is paramount when addressing EOL wishes with patients. Emphasis on freedom from suffering may not resonate with our patients. Physicians should consider including family members, understand how cost of medical care affects patient decisions, and explore what living as long as possible means.

The Power to Choose: Prostate Cancer Screening and Shared Decision-Making in African-American and Afro-Caribbean Men

Goals and Objectives: To increase documentation of shared decision-making (SDM) for prostate cancer screening to 25% in 2 months in males of African descent aged 45-69 years in the resident-run primary care practice at Kings County Hospital (KCH).

Background: In 2018, the US Preventive Services Task Force (USPSTF) recommended that men engage in SDM with their clinicians regarding the use of Prostate-Specific Antigen (PSA) in prostate cancer screening. The lack of generalizability of this guideline to our high-risk population may reflect a broader healthcare disparity in our urban community.

Design/Methods: An educational intervention directed at resident physicians highlighted the gap in documentation, the 2018 USPSTF guidelines and population specific recommendations from our Department of Urology. A patient friendly fact-sheet emphasizing risks and benefits of PSA screening was developed for use during patient encounters. A post-intervention prospective chart review of SDM documentation was then performed.

Results: At baseline, 83 charts were reviewed and only one provider documented a PSA discussion. There was no documentation of SDM in any other chart, yet 37% of patients had a PSA ordered. In the post-intervention group, SDM was documented in 13 out of 54 encounters (24%). Of the 13, 7 agreed to testing and 6 declined. 16% of patients had PSA ordered without documentation of SDM. Two providers deferred the discussion until a future visit.

Conclusions/Limitations/Next Steps: Current USPSTF guidelines for prostate cancer screening are not population specific. Physicians should tailor screening and SDM to the population that they serve, especially in communities at higher risk. Increased SDM and screening in our high risk population will support future research around the epidemiology of prostate cancer in males of African descent, allowing future guidelines to address the health care disparities in our primary care community.
Racial Disparities in Preeclampsia and Preterm Birth

Racial disparities exist in both preeclampsia and preterm birth. According to one study, preeclampsia in women aged 20-34 years occurred in African American women at a 3.2% rate compared to a 1.8% rate in Caucasian women. According to another 2014 study, African American infants were approximately 50% more likely to be born preterm than Caucasian, Hispanic, and Asian infants. SUNY Downstate Medical Center serves socioeconomically disadvantaged populations. Approximately 1400 infants are delivered annually, 90% of whom are African American. This study examined records of 9373 deliveries from 2010 to 2015 for preeclampsia, preterm labor, and preterm birth. Data was analyzed using Chi-square and Mann-Whitney U tests. It was found African American women were diagnosed with preeclampsia at a rate of 6.68% (95% CI 6.15-7.21%), whereas non-African American women were diagnosed at a rate of 3.26% (95% CI 1.92-4.60%). African American women delivered preterm 26.96% (95% CI 26.02-27.85%) of the time, whereas women of other races delivered preterm 22.67% (95% CI 19.51-25.82%) of the time. African American patients with preeclampsia gave birth at lower gestational ages, on average, than African American patients without preeclampsia (35.67+/-3.845 versus 36.40+/-5.017, P<0.001), while non-African American patients with preeclampsia did not give birth at lower gestational ages, on average, than non-African American patients without preeclampsia (36.71+/-3.989 versus 36.89+/-4.383, P=0.311), suggesting preeclampsia has a more severe effect on preterm birth among African American than non-African American women. The data compiled may raise awareness among clinicians of racial disparities present in pregnancy.

Evaluation of the Content and Accessibility of Web-Based Content for Orthopaedic Adult Reconstruction Fellowship Applicants

Introduction: Orthopaedic surgery residents seeking fellowship training in adult reconstruction (AR) often use the Internet to research programs and manage applications. This study evaluated accessibility of information from commonly used databases/search engines and assessed AR fellowship websites’ content.

Methods: Programs were compiled using SF Match, AAHKS, Hip Society, Knee Society, MSTS, and ACGME. They were assessed for accessibility via viable links to fellowship-specific websites and Google searches using program names and keywords “adult reconstruction orthopaedic fellowship” and “hip knee tumor orthopaedic fellowship”. These websites were judged on two categories: program information and recruitment content.

Results: Of the 85 programs identified, 82 were listed by AAHKS, and 84 were listed by SF Match. Of the 85 total programs, 11 (13%) were in SF Match, 4 (5%) had viable program-specific links listed in AAHKS, and 68 (80%) programs had fellowship-specific websites. Of the 68 programs, 96% had program descriptions, 71% discussed the application process, 26% discussed current fellows, and 17.9% discussed fellowship graduates. 59% of programs had information on didactics, 81% highlighted commonly-performed cases, and 11 (16%) had on-call schedules. Program websites differed from self-reported information on SF Match (i.e. case volume and anticipated research production were reported at 70% and 45% lower rates, respectively). Google searches using common key words found websites for 78% and 74% of programs, respectively, though this rose to 97% and 93% when excluding programs without websites. 18 of the 22 current ACGME accredited programs were listed through SF Match and AAHKS.

Conclusions: This study shows the lack of websites with complete information for orthopaedic residents applying for AR fellowship from the SF Match and AAHKS databases. Improvement in accessibility and quality of information on these websites can help applicants obtain information.
Daniel Suarez
Advisor(s): Aditya Maheshwari

Does Surgical Approach for Total Hip Arthroplasty Impact Infection Risk in the Obese Patient: A Systematic Review

Introduction: Surgical approach may be a modifiable risk factor for surgical site infection (SSI) following total hip arthroplasty (THA). This study sought to systematically review the combined effects of surgical approach and obesity, an additional risk factor, on the rate of THA SSIs.

Methods: We reviewed three literature databases to identify studies that reported on THA SSI rates by surgical approach. The following inclusion criteria were implemented: (1) underwent primary unilateral THA; (2) SSIs were reported, with stratification by pt body mass index (BMI, kg/m2); and (3) SSI rates were reported, with stratification by surgical approach.

Results: Five studies reported on the direct anterior approach (DAA) alone. One study (n=1,621) found that the SSI rate was significantly higher in pts with a BMI>35. A second study (n=611) reported that wound complication rate correlated with increasing obesity class. A third study (n=210) found that BMI>30 had a significantly higher superficial wound complication rate. The fourth study (n=136) found a non-significant increase in SSIs in BMI>35 vs. BMI<25, but a significantly higher rate of reoperations.

Two studies compared DAA and posterior approach (PA). One study (n=3,759) found BMI>30 in DAA group had an increased SSI risk and BMI>40 with even higher risk. BMI>30 with PA group did not carry increased risk, but BMI>40 did. The second (n=4,651) found BMI>35 was an independent risk factor for both wound dehiscence and periprosthetic joint infections (PJI). One study (n=1,207) compared Hardinge approach and PA, reporting that increasing BMI had an increased PJI risk for PA only.

Conclusion: The literature suggests that obesity modulates SSI risk differently based on THA approach. With DAA, increasing BMI had a greater impact on SSI risk. It remains unclear whether PA carries the same SSI risk as DAA for obese pts. BMI>40 may be the threshold at which SSI risk increases for PA. Further comparative studies are warranted.

Jason Rahimzadeh
Advisor(s): Aditya Maheshwari

Single-Stage Multiple versus Multi-Staged Single Intramedullary Nailing for Synchronous Multiple Long Bone Involvement in Metastatic Bone Disease

Introduction- Intramedullary nailing for pathologic fractures is a common treatment for metastatic bone disease. Given the theoretical higher risk of complication, it has been recommended to perform single stage nailing of the long bones. This study investigated whether single-staged, multiple long bone (SSMB) intramedullary nailing is as safe as multi-stage nailing of one or multiple bone (MSMB) procedures or single-stage single long bone (SSSB, controls) intramedullary nailing.

Methods- This study is a retrospective review of impending or pathologic fractures in long bones in the setting of metastatic bone disease from 2011 to 2018. All patients with >1 intramedullary nails placed were grouped by single-staged, multiple long bone (SSMB), multi-staged, multiple long bone (MSMB) and single-staged, single long bone (SSSB).

Results- There were 15 patients in the SSMB cohort and 23 patients in the MSMB cohort and 54 in control. SSMB patients had higher BMI than MSMB and SSSB. Among the 150 intramedullary nails, 85 were placed for impending fracture and 65 for pathologic fracture, in femur (n=89), humerus (n=51), and radius (n=5). In single-staged the most common combinations were femur-humerus and in multi-staged was femoral. SSMB had lower blood loss, complications and transfusion than MSMB, though both were higher than SSSB. There were two deaths in SSMB, six in MSMB, and three in SSSB.

Discussion- This study has shown patients can undergo intramedullary nailing of multiple long bones in a single procedure without higher risk for adverse outcomes when compared to placing one or more intramedullary nails across multiple surgeries.
A Call to "Own the Bone": Osteoporosis is a Predictor for Two-Year Adverse Outcomes in the Adult Population Undergoing Short Fusion for Degenerative Lumbar Disease

Introduction: Osteoporosis (OP) affects nearly 200 million ppl globally. Though spinal fusion is considered for pts with degenerative disc disease (DDD), there is little data regarding long-term outcomes in OP pts undergoing lumbar fusion for DDD. This study investigated whether a dx of OP increases the risk of adverse 2-yr outcomes in DDD pts undergoing short lumbar fusion.

Methods: Utilizing the NYS Statewide Planning and Research Coop. System (SPARCS), all pts from 2009-11 with ICD-9 dx codes corresponding to DDD who underwent 2-3-level lumbar fusion were identified. Any pts with other bone mineralization disorders and systemic endocrine disorders affecting bone quality or production were excluded. Pts with trauma, systemic disease(s) and infxnss were also excluded. Pts were stratified by presence or absence of OP and were compared for demographics, hospital-related parameters, 2-yr complics and reops. Multivariate binary logistic regression models were used to ID significant predictors of complics.

Results: Included: 29,028 pts (OP=1,353 (4.7%), No-OP=27,675). OP pts were older (66.9 vs 52.6 yrs), more often female (85.1% vs 48.4%) and white (82.8% vs 73.5%), p<0.001. Length of stay and total surgical charges were higher for OP pts (4.9 vs 4.1 days; $74,484 vs $73,724), p<0.001. Rates of med complics were higher for OP pts: acute renal failure (8.9% vs 4.7%), and DVTs (3.4% vs 1.6%), all p<0.01. OP pts also had higher rates of implant-related (3.4% vs 1.9%) and wound complics (9.8% vs 5.9%), p<0.01. Baseline OP was a strongly associated with 2-yr med and surg complics (OR=1.62, 1.66), p<0.001. Pts with OP were at significantly greater odds of reoperations (OR=1.34).

Conclusions: Pts with OP undergoing 2-3-level lumbar fusion for DDD were at higher risk of 2-yr med and surgical complics, and OP pts experienced higher rates of wound and implant-related complics. These findings highlight the importance of rigorous preop metabolic workup prior to spinal surgery.

The Five-Year Baseline Prevalence of Metabolic and Endocrine Bone Disorders in Patients Undergoing Short Spinal Fusion for Degenerative Disc Disease

Introduction: This study investigated the prevalence and etiology of mineral bone diseases (MBDs) in patients with degenerative disc disease (DDD). Negative outcomes in spinal fusion (SF) secondary to low bone density are well described, but the prevalence of mineral bone diseases (MBDs) in this population is underreported.

Methods: The New York Statewide Planning and Research Cooperative System database was queried to identify all DDD patients from 2009 to 2013. Patients were compared by age, gender, and race. MBD diagnoses were recorded for each group, including: osteoporosis (OP), vitamin D deficiency (VDD), postsurgical hypothyroidism (PHT), glucocorticoid deficiency (GD), nontoxic uninodular goiter (NUG), and sickle cell trait (SCT). Prevalence was calculated.

Results: 21,069 patients were identified. The most prevalent MBDs in the DDD population were: (1) OP 5.3% (2) VDD 1.6% (3) PHT 0.8% (4) NUG 0.4% (5) GD 0.3%. Each age range varied in the prevalence order of MBDs. The most common for the <45yo group were VDD 0.8% and OP 0.4%, while OP was the most common etiology among 45-64yo (OP 3.4%, VDD 1.6%) and ≥65yo (OP 13.5%, VDD 2.4%). The OP rate in each age range significantly differed from the other two (0.4 vs 3.4 vs 13.5%; all p<0.05). Females experienced higher rates of the 5 most common MBDs compared to males (OP 8.7 vs 1.4%; VDD 2.1 vs 0.9%; PHT 1.2 vs 0.3%; GD 0.4 vs 0.2%; NUG 0.5 vs 0.2%), all p=0.01. OP was the most common MBD across all races (W 6.0%, B 2.2%, H 3.2%, O 4.2%). White pts had significantly higher OP rate than Black or Hispanic pts, p=0.05. VDD was the second most prevalent in all races (W 1.6%, B 2.9%, H 0.8%, O 1.4%), with Hispanics having lower rates of VDD than Whites and Blacks, p<0.05.

Conclusion: The most common MBDs in the general population were OP and VDD. Older pts had higher MBD rates. OP is the most prevalent MBD for DDD pts. Females exhibited higher MBD rates than males, and White pts had the highest OP prevalence.
Adam Wolfert  
Advisor(s): Carl Paulino

The Impact of Comorbid Mental Health Disorders on Two-Year Adverse Outcomes Following Posterior Spinal Fusion for Adolescent Idiopathic Scoliosis

Introduction: It is not well defined whether the diagnosis of a mental health disorder (MHD) affects the outcomes of posterior spinal fusion (PSF) of adolescent idiopathic scoliosis (AIS) patients aged 10-25 years. This study aimed to compare 2 year complication and revision rates of 10-25 year-old AIS patients with a diagnosis of a MHD and non-MHD undergoing a minimum 4-level SF.

Methods: The NYS Statewide Planning and Research Cooperative System was queried for all 10-25 year old MHD patients who underwent ≥4 levels of PSF from 2009-11 with ≥2 year follow-up. MHDs included: depressive, anxiety, sleep, stress, substance/polysubstance abuse, attention deficit/hyperactivity, eating, and poly-MHDs. Patients excluded for trauma, systemic disease, or infection. The group was 1:1 matched to No-MHD patients by age, gender, race, and Charlson/Deyo index. The groups were compared for differences in 2 year complication and revision rates. Multivariate binary stepwise logistic regression identified predictors of these outcomes.

Results: 308 patients (n=154 each). Anxiety (18.8%), ADHD (16.6%), depressive (12.3%), and poly-MHD (9.4%) were the most frequent MHDs. MHD patients had significantly worse Charlson/Deyo scores at time of index surgery (0.18 vs 0.19; p=0.776). MHD and non-MHD patients had similar rates of wound complications, renal failure, sepsis, implant related complications, and blood transfusions. Both cohorts had similar rates of revision surgery within 2 years.

Conclusion: In this study, MHD in AIS was not associated with poor outcomes after PSF. This data may provide spine surgeons with increased clarity in counseling patients prior to PSF on AIS patients with MHDs.

Alfonso Caetta  
Advisor(s): Carl Paulino

A Decade of Adolescent Idiopathic Scoliosis Care Adhering to SRS Guidelines in an Underserved Population: A Single-Surgeon Registry

Intro: The SRS has established guidelines to manage AIS. We evaluated a single spine surgeon’s experience treating primary AIS over >10 years in an underserved community. Data revealed that SRS guideline adherence led to low rates of curve progression, w/ only 0.7-1.5% progresses into worse SRS categories between 1Y & 2Y FU. Over the years, Risser grades of presenting pts were lower for the same curves indicating improved AIS community awareness & early detection.

Methods: Retrospective review of primary pts presenting from 2006-18 for evaluation of AIS. Inclusion criteria: 10-25 y/o, available clinical & radiographic (36-inch full-spine xrays). Risser grade, full coronal & sagittal radiographic analysis were obtained. Pts were categorized & treated via known guidelines: SRS-Observation, SRS-Bracing & SRS-Surgical candidates. Pts w/ 2 data points of 1Y & 2Y FU were sub-analyzed to investigate disease progression.

Results: 552 pts, mean age 14.3±2.6 & 67% Female. Risser grades: R0, n=85 (15.4%), R1, n=32 (5.8%), R2, n=85 (15.4%), R3, n=147 (24.8%), R4, n=122 (22.1%), R5; n=87 (15.8%). At BL, SRS-O (n=326, 59.1%, 21.9°), SRS-B (n=128, 23.2%, 33.5°), SRS-S (n=98, 17.8%, 59°). 325 (58.8%) met AIS SRS criteria. Curve breakdown: Lumbar (n=52, 16%), Thoracic (n=196, 60.3%) & Thoracolumbar (n=77, 23.7%). Analyzing pts w/ 2Y FU revealed that among pts w/ BL curves (<25°), only 10.8% progressed into [25-45°] at 1Y, & 11.5% total progressed at 2Y FU. Among pts w/ 25-45° BL curves, 22% corrected into [<25°] & 3.8% progressed into [>45°] at 1Y & 5.2% progressed at 2Y. Pts presenting w/ Risser (0-2) significantly increased from 8.5% in 2008 to 25% in 2018 despite comparable mean annual curve magnitude (33.9 to 30.3°). Conversely, pts presenting w/ Risser 5 decreased from 49.2% to 26.8% from 2008-18.

Conclusion: SRS management guideline adherence & AIS pt education over a decade of practice lowered rate of curves progression and improved AIS education in our underserved community.
Does Baseline Substance Use Predict Subsequent Development of Mental Health Disorders in Adolescent Idiopathic Scoliosis Patients?

Introduction: Little is known as to whether the association btw MHD and substance abuse history exists among adolescent idiopathic scoliosis (AIS) pts. We compared the 2-year incidence of mental health disorders (MHDs) in AIS pts with and without baseline (BL) substance abuse to identify if it was a predictor for new-onset MHD development. Baseline substance abuse is defined by current or prior substance abuse.

Methods: The NYS Statewide Planning and Research Cooperative System was reviewed to identify all 10-25 y/o AIS pts with prior or concurrent substance abuse (AIS-Sub: alcohol, tobacco, cannabis, amphetamine, opioid, or polysubstance) from 2009-11 to ensure 2Y FU. Pts with prior or concurrent MHD(s) were excluded. AIS-Sub were 1:1 propensity score-matched by age, sex, race, and DEYO index to AIS pts without substance abuse (AIS-NoSub). Cohorts were compared for subsequent incidence/development of individual and overall MHDs (depressive, anxiety, stress, sleep, and/or eating disorder). Binary stepwise logistic regressions calculated odds ratios (OR) of developing individual or any MHDs based on baseline substance abuse.

Results: Included: 386 AIS pts (n=193 each). AIS-Sub and AIS-NoSub pts had similar age (20.8), sex (62.2 vs 62.7% male), race (54.9 vs 52.8% white), insurance (55.4 vs 45.6% Medicaid), and DEYO. AIS-Sub pts had higher rates of new-onset subsequent overall MHDs (16.1 v 3.6%), with only depressive d/os higher among individual MHDs (10.9 v 0.5%), both p<0.001. BL substance abuse independently predicted subsequent diagnosis of overall MHD (OR=6.8). Among individual MHDs, BL substance abuse predicted development of new-onset depressive d/os (OR=47.0), all p<0.002; it did not predict development of anxiety, stress, sleep, or eating disorders.

Conclusion: AIS pts positive for substance abuse were at increased risk of developing any new-onset MHD, specifically depressive d/os.

The Impact of Preoperative Cannabis Use on Outcomes Following Thoracolumbar Spinal Fusion: A Propensity Score-Matched Analysis

Introduction: There is limited literature evaluating outcomes following spinal surgery patients who use cannabis despite the increasing acceptance and use of cannabis. This study sought to compare the 90 day outcomes, complication rates and 2 year revision rates between cannabis users and non-users following thoracolumbar spinal fusion.

Methods: The Statewide Planning and Research Cooperative System database was queried to identify all patients older than 18 who underwent thoracolumbar spinal fusion from 2009-13. Patients were included if they had 90 day follow up for complications and readmissions or 2 year revisions. Patients with preoperative cannabis use were identified. Patients were excluded for systemic disease, osteomyelitis, cancer, trauma, or concomitant substance or polysubstance abuse/dependence. Cannabis patients were 1:1 propensity score-matched by age, gender, race, Deyo score, fusion levels and approach, and tobacco use to non-cannabis users and compared for hospital-related parameters, rates of 90 day complications and readmissions and 2 year revisions. Multivariate binary step-wise logistic regression models identified independent predictors of outcomes.

Results: 628 patients (n=314 each) were identified, with a comparable age, gender, and fusion approach and levels distribution. More cannabis patients were African American and utilized Medicaid. Regression revealed baseline cannabis use as a negative independent predictor of 90 day complications (OR=0.43). Cannabis use was not associated with increased surgical or overall 90 day complications, 90 day readmissions, or 2 year revisions.

Conclusion: Though cannabis was protective against postoperative anemia and complication, use resulted in no difference in readmission or revisions. These findings indicate that cannabis use may not require delay in preoperative clearance.
Comparing 30-Day Outcomes after Anterior Cervical Discectomy and Fusion between Orthopaedic Surgeons and Neurosurgeons: An 8-Year Analysis

Introduction: This study evaluated 30-day postoperative outcomes following anterior cervical discectomy and fusions (ACDF) for differences between those performed by orthopaedic surgeons and neurosurgeons. The demographics, complications, operative time, length of stay, reoperation and readmission rate over an 8-year period were compared.

Methods: ACDF surgeries eligible for at least 30-day follow-up between 2008-2016 were identified from The National Surgical Quality Improvement Program (NSQIP) database and classified under orthopaedic versus neurosurgery. Patient demographics, comorbidities, preoperative labs, perioperative factors, 30-day postoperative complication, reoperation and readmission rates were compared using univariate analysis. Potential predictive factors for 30-day postoperative outcomes were identified using regression models.

Results: 77,071 ACDF cases, 33.1% orthopaedic and 66.9% neurosurgery, were included. Orthopaedic ACDF had comparable 30-day overall (4.2 vs 3.9%, p=0.051), major (1.7 vs 1.5%, p=0.153), and minor (3.2 vs 3.1%, p=0.308) complication rates, and 30-day reoperation (2.2 vs 2.2%, p=0.570) and readmission (4.2 vs 4.2%, p=0.754) rates. Orthopaedic patients had slightly longer operative time (170.3 vs 159.3 min, p<0.001), longer length of stay (2.7 vs 2.4 days, p=0.048) and higher postoperative blood transfusion rates (7.5 vs 4.4%, p<0.001). Surgeon specialty was not a predictor for increased overall short-term complications (OR 1.068, p=0.094) or reoperations (OR 0.985, p=0.863), Orthopaedic ACDF was a predictor for reduced odds of 30-day readmission (OR 0.766, p=0.032). Patient age was a significant predictor for 30-day overall complication (OR 1.037, p<0.010), reoperation (OR 1.021, p<0.010) and readmission (OR 1.018, p=0.010) rates.

Conclusion: Orthopaedic surgeons may be under-performing ACDF procedures despite similar 30-day complications, reoperations and readmissions compared to neurosurgeons.

Comparing Neurological Complications across Anterior, Posterior and Combined Approaches in the Setting of Cervical Spinal Fusion

Introduction: Anterior (ACDF), posterior (PCF) or combined surgical approach are commonly employed for cervical fusion, yet comparative rates of postop neurological complications are not well delineated. We compared and identified predictors of 90-day neuro and other complications between ACDF, PCF, and combined.

Methods: The NYS SPARCS database was used to identify patients who underwent 2-3-level ACDF, PCF, or ACDF-PCF with ≤90-day follow up from 2009-13. Demographics, hospital-related parameters, and 90-day neuro and med/surg complications, readmissions and revisions were compared across cohorts. Multivariate logistic regression was used to identify independent predictors.

Results: Included: 40035 pts (ACDF=35355, PCF=2964; combined=1716). PCF vs. combined approach and ACDF had highest overall neurological complications rates (2.3 vs 2.02, 0.77%), rates of implant-related complications (5.48 vs 2.68, 0.7%; p<0.005), overall surgical complications (6.7 vs 5.6, 1.41%), rate of total complications (20.3 vs 20.0, 6.697%), readmissions (23.12 vs 23.0, 7.62%), and revisions (25.8 vs 12.8, 5.57%), all p<0.001, unless otherwise noted. Combined vs PCF and ACDF had the highest rate of medical complications (15.8 vs 13.8, 5.61%; p<0.001).

With ACDF as a reference, PCF and combined approach were associated with increased odds of 90-day neurological complications (OR=2.0 vs 1.9) and revisions (OR=4.2 vs 2.3), while combined was more strongly associated with surgical complications (OR=3.9 vs 3.5), total complications (OR=2.6 vs 2.5), med complications (OR=2.341 vs 2.346), and readmissions (OR=2.0 vs 3.0), all p<0.001.

Conclusion: PCF had increased, individual neurological complication rates, and was more strongly associated with incidence of overall neuro complications in the 90-day postop period when compared to combined approach and ACDF. These data may raise cognizance of variation in neurological risks by approach in cervical spine surgery.
Mahee Islam  
Advisor(s): Carl Paulino

**Scoliosis and Social Media: Comparing the Quality of Available Information across the Top Social Media Platforms**

Introduction: The growth of social media in recent years as a means of dissemination of health-related information has created new challenges for physicians. There are few studies that evaluated social media information quality on for adolescent idiopathic scoliosis (AIS). This study aimed to compare the quality of scoliosis-related information across four common social media platforms.

Methods: The top four popular social media platforms, Facebook, Twitter, Instagram, and LinkedIn, were queried in November 2018 using unfiltered keyword search: “scoliosis.” The top 100 unique, most recent search responses were extracted and assessed for content by two independent examiners. Following exclusion, the top 50 results were analyzed. The scoliosis-specific content quality (SSCQ) score and DISCERN instrument were used. Analysis of variance was employed to compare mean scores across platforms.

Results: 200 results were identified, all posts from Instagram were not suitable to SSCQ and DISCERN assessment. Of the 150 left, 70 contained sufficient information for analysis: 34 on Facebook, 19 on LinkedIn, 17 on Twitter, and 0 on Instagram. Mean SSCQ score across all platforms was found to be 7.7±5, with no difference in SSCQ score across platforms (Facebook 8.3±6.0; LinkedIn 7.8±4.1; Twitter 6.5±3.9; p=0.498). Mean DISCERN score across all three platforms was 44.7±11.9, with no differences across groups (Facebook 43.3±13.0; LinkedIn 48.8±10.9; Twitter 43.6±11.3; p=0.246).

Conclusion: Lower quality information was found across Facebook, LinkedIn, and Twitter. Moreover, no difference was appreciated in content quality across platforms when comparing SSCQ and DISCERN scores.

Take home message: Available scoliosis-related information was of low-quality across analyzable social media platforms, with no differences in content-quality across Facebook, LinkedIn, and Twitter. Instagram was unamenable to quality assessment with established metrics.

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Michael Dubner  
Advisor(s): Carl Paulino

**First Application of Dubousset Functional Test in Patients with Spinal Pathologies: The Future of Objective Clinical Outcomes is now.**

Introduction: Our understanding of pts’ function is lacking a more objective and quantified mechanism of assessment. We sought employ the recently proposed Dubousset Functional Test (DFT) to identify correlations between pt-reported outcome measures (PROs) and objective functional performance metrics.

Methods: Prospective study w/ consecutive primary pt enrollment of those presenting to spine service for evaluation of spinal deformity or degenerative lumbar disease. Included were pts who completed DFT tests and PROs (ODI, NDI, SF-12 mental and physical component scores [MCS, PCS]), and a lifestyle/functionality survey. Montreal Cognitive Assessment (MoCA) was used to evaluate cognitive functioning. DFT is a functional test described by Dr. Jean Dubousset. Tests were timed and pt performance was scored by seconds required to finish the test. DFT reference/normative values were UWT: 14.8s, ST: 6.3s, DST: 6.0s, and DTT: 12.8s. Descriptive analysis evaluated global performance of DFT in our population. Correlation analyses investigated the DFT vs PROs relationship.

Results: Included: 35 pts, mean age: 47.7±16.6y; 68% Female, mean BMI 28.7±5.9kg/m2). Mean DFT test durations: UWT, 31.2±23.5s; DTT, 25.2±16.8s; DST, 11.7±7.9s (7 pts unable to complete); and ST, 11.1±6.1s (3 pts unable to complete). Significant correlations were observed between DFT components and PROs, including UWT vs. ODI (r=0.675), DTT vs. SF12 MCS (r=0.307), DST vs. ODI (r=0.614), DST vs. SF12 PCS (r=0.445), ST vs. ODI (r=0.675). The DTT significantly correlated with MoCA scores of cognitive ability (r=-0.309), all p<0.05.

Conclusion: We propose the DFT as a method to assess functionality of spinal pathology pts. Time spent performing DFT tests correlated with established PROs utilized in the spine literature. Correlation between the Dual Tasking test and cognitive functionality may reveal the relationship between alignment, balance and coordination when adding radiographic alignment to the equation.
Predictors of ICU LOS in AIS

Introduction: Studies have examined procedures after posterior spinal fusion (PSF) for adolescent idiopathic scoliosis (AIS) to improve outcomes & reduce complications/readmissions. Little predictive data exists for ICU length of stay (ICU LOS) for AIS pts following PSF. Thus, we sought to identify baseline (BL) factors associated with increased postop ICU LOS.

Methods: All AIS pts undergoing elective PSF (CPT-22800-4) by ortho/neurosurgeons in 2016 were identified in the ACS NSQIP-Pediatric Procedure Targeted database & grouped pts by ICU LOS (days): G1,0-1; G2,2-3; & G3,>3 days. BL demographics, comorbidities & periop factors were compared via univariate analysis with post-hoc Bonferroni. Multivariate regression identified predictors of G2 & G3.

Results: Included: 2346 AIS pts undergoing PSF (G1: 81.8%; G2: 16.5%, G3: 1.7%). Age, sex, or race were comparable across cohorts. G3 & G2 had higher asthma rates than G1: (19.5, 10.1 vs 5.5%). G3 vs G2 & G1 had higher structural airway abnormalities (19.5 vs 1.6, 1.1%) & hematologic disorders (9.8 vs 1.0, 0.8%), all p<0.05. Cognitive impairment/developmental delay rates were highest for G3 (26.8 vs 10.9, 6.2%), all p<0.032. OR time was highest for G3 vs G2 & G1 (346.1 vs 292.6 vs 259.5mins). G3 had the highest % of pts with ≥13-level fused (51.2%) vs G2 & G1 (20.7, 26.5%), all p<0.05. Groups had comparable % pts with ≥6-level PSF. BL hematologic disorders & structural airway abnormalities increased odds of >3D ICU LOS (OR=9.0, 6.5; p<0.005). Asthma & cognitive impairment increased odds of >3 & 2-3d ICU LOS (OR=2.7, 1.7; OR=2.7, 1.9), respectively, all p<0.05.

Conclusion: Increased OR time & BL comorbidities correlated with increased ICU LOS in AIS pts. Hematologic disorders, structural airway abnormalities, asthma & cognitive impairment increased the odds of >3d ICU LOS by 9.0, 6.5, 2.7 & 2.7-fold, respectively. The results may improve preop optimization & postop risk-stratification, curbing costs & postop complications.

Bridging the Pay Gap: An Assessment of Medicare Procedure Volume and Reimbursement among Spine Surgeons

Introduction: Few studies have compared salary and procedure volume of male and female orthopedic spine surgeons in the United States. Particularly, the pay gap has not been analyzed for spinal fusions. This study sought to calculate the number of female and male surgeons who performed fusion procedures, assess the number of claims submitted per surgeon and evaluate how reimbursements varied between cohorts.

Methods: Surgeons who performed spinal fusions in 2016 were identified from the Medicare Provider Utilization and Payment Public Use File database and divided into gender cohorts. For each cohort, mean total fusion procedures, anterior lower, anterior upper and posterior/posterolateral fusions were obtained. Total claims (hospital stay, office visits), total surgical claims, and reimbursements for each were calculated. Cohorts were compared using two-tailed t-tests. Results: 2,035 spine surgeons were identified, 23 were females (1.1%). Both male and female surgeons performed similar mean anterior lower (23 vs. 14) and posterior/posterolateral fusions (23 vs. 21), all p>0.05. However, male surgeons performed fewer anterior upper fusions (18 vs. 27; p=0.03). Both cohorts performed similar numbers of total fusions (55.9 vs. 49.0) and both submitted comparable numbers of claims per surgeon, all p>0.05. Males received higher total claim reimbursements ($87,779 vs. $50,439; p=0.04), but total surgical reimbursements ($77,052 vs. $54,240) and reimbursement rates for fusion at any site did not vary significantly between genders, all p>0.05.

Discussion: When analyzing the gender gap in physician salary for spinal fusions, male and female surgeons performed similar numbers of fusions in 2016. Although the difference in mean total claims between genders was not significant, male surgeons submitted more total claims than female surgeons, and males had significantly greater total reimbursements. Reimbursements for specific procedures did not differ significantly across genders.
Does Structural Compromise of the Aorta in Patients with Aortic Pathologies Predict Increased Spinal and Vascular Complications and Reoperations in Patients Undergoing Anterior Approach to the Spine?

Introduction: Anterior spinal fusion (ASF) presents unique challenges, but it is not documented whether structural aortic deterioration or compromise of the aorta (AComp) impacts postoperative outcomes following ASF. We evaluated adverse outcomes following ASF in the setting of AComp.

Methods: Using SPARCS, we identified thoracolumbar ASF patients with baseline AComp (aneurysm, dissection, atherosclerosis, aortitis, aortic tumors) and 1:1 propensity score-matched them to No-AComp patients by age, sex, race, and Charlson/Deyo index. Patients were compared at 90-Day and 2-Year follow-up for vascular/medical/surgical complications, readmissions, and revisions (i.e. subsequent ASF or major vessel repair/revision). Multivariate binary stepwise logistic regression identified independent outcome predictors.

Results: 90 patients reached 90-Day follow-up (45 each); 64 patients reached 2-Year follow-up (32 each). AComp and No-AComp had comparable demographic data: age (63.6 vs 65.4 Years), sex (57.8 vs 53.5% male), and LOS (5.3 vs 8 Days), p>0.05. Through 90-Day follow-up, AComp had similar individual vascular complications, including iatrogenic puncture (6.7 vs 0%), hemorrhage (0 vs 2.2%), and hematoma (2.2% each), and overall vascular complications (8.9 vs 4.4%). Overall complications (33.3 vs 31.1%) were comparable, though No-AComp patients had higher surgical complications (11.1 vs 0%, p=0.021). Through 2-Year follow-up, AComp vs No-AComp had comparable vascular (9.4 vs 0%), overall complications (34.4 vs 40.6%), and other outcomes, all p>0.05. Neither group reported revisions through 2-Year follow-up. AComp did not increase odds of adverse outcomes through 2-Year follow-up.

Conclusion: Aortic compromise in the setting of thoracolumbar ASF did not predispose cohort patients to vascular complications or anterior spinal/vascular revision/repair through 2-Year follow-up.

Impact of Prematurity on Immediate Postoperative Outcomes Following Posterior Spinal Fusion for Adolescent Idiopathic Scoliosis

Introduction: Patients born prematurely are at an increased likelihood of cardiopulmonary complications when undergoing general anesthesia. However, little is known about post-surgical outcomes of premature patients that have adolescent idiopathic scoliosis (AIS). The study sought to elucidate 30-day surgical outcomes of premature patients that underwent posterior spinal fusion (PSF) for AIS.

Methods: Utilizing the ACS NSQIP-Pediatric database, all AIS patients that underwent PSF between 2012 and 2016 were identified. Patients were grouped by prematurity at birth (<37 weeks) and were 1:1 propensity score-matched for age, sex, and number of spinal levels fused. Patient demographics, hospital parameters, and 30-day postoperative outcomes were measured.

Results: 958 patients (479 in each group) were assessed and groups had comparable demographics. Premature patients had higher baseline cognitive impairment (37.2 v 11.7%), cerebral palsy (22.6 v 4.0%), GI disease (16.5 v 8.4%), and asthma (12.5 v 6.3%), all p≤0.001. Overall and individual complications, including superficial and deep infections and revisions were comparable between groups. However, premature patients had higher readmission rates within 30 days of surgery (11.6 vs 2.7%, p<0.01). Regression analysis revealed that prematurity at birth predicted 30-day readmission (OR=3.0, 95%CI, 1.1-8.3), deep space/organ infection (OR=4.4, 95%CI, 1.2-15.5), and overall infection (OR=2.3, 95%CI, 1.1-4.8) following PSF (p=0.035). Baseline cognitive impairment among AIS patients predicted 30-day postoperative complications (OR=4.3, 95%CI, 1.9-9.7), and revisions (OR=4.6, 95%CI, 1.6-13.3) following PSF (both p<0.006).

Conclusion: Overall, premature patients with AIS are at an increased risk of readmission, deep space/organ infection, and overall infection following PSF. These data will be valuable for surgeons to consider during preoperative risk stratification and post-operative management.
The Impact of Degree of Prematurity at Birth on Short-Term Postoperative Outcomes Following ≥7-Level Posterior Spinal Fusion for Adolescent Idiopathic Scoliosis

Introduction: Premature pts are at increased risk for complications under general anesthesia, yet this risk is not well delineated for AIS pts undergoing PSF.

Methods: AIS pts who underwent ≥7lvl PSF in ACS NSQIP-Pediatric database (2012-16) were stratified by WHO preterm groups: extremely (EP;<28wks), very (VP;28≤x<32wks), moderate-to-late (MLP;32≤x<37wks), and term (>37wks). Univariate analysis w/posthoc Bonferroni compared demos, hospital parameters, and 30D outcomes. Multivariate logistic regression identified independent outcome predictors (covariates: prematurity group, age, sex, race, and BL comorbidities).

Results: Included: 5531 pts (Term=5099, MLP=250, VP=101, EP=81). VP & EP had more males than MLP and Term (36.6, 30.9 vs 31.2, 23.2%, p<0.001). EP had higher BL rates of the following than VP, MLP, and Term: cognitive impairment (58 v 41.6 v 27.2 v 11%) and neuromuscular diseases (44.4 vs 35.6 vs 23.2 vs 14.5%), all p<0.001. OR time and % ≥13-fusions progressively increased across prematurity groups (30.2, 40, 43.6, 53.1%), p<0.001. Compared to term, EP had higher rates of organ space infection (1.2 v 0.1%, p=0.021), VP had highest rates of wound dehiscence, UTI, & overall complications (3, 3, 9.9%), and MLP had highest rate of deep SSI (2.4%). 30D readmission increased w/ prematurity. EP predicted deep SSI/organ space infection (OR=4), VP predicted UTI, superficial SSI/wound dehiscence, & any infection (OR=9.8, 4.4, 4.4), and MLP predicted renal insufficiency, deep SSI/organ space infection & any infections (OR=9.7, 5.2, 3.2), all p<0.05. BL cognitive impairment (OR=3.5, 3, 2.6) and neuromuscular (OR=2.0, 2.3, 1.6) were predictors for total complications, readmissions, & reoperations, all p<0.05.

Conclusion: Degree of prematurity differentially impacted rates of 30D adverse outcomes following ≥7-lvl PSF in AIS pts. These results can guide preop optimization and support surgeons for postop risk-stratification and counseling patients & their families.

Reduced Wound Breakdown Rates with the Sinus Tarsi Approach to Surgical Fixation of Calcaneus Fractures Compared to an Extensile Lateral Approach

Purpose: Calcaneus fractures are traditionally approached for open reduction and internal fixation (ORIF) via the extensile lateral approach (ELA). Wound complications and nerve injury have led to the development of less invasive techniques such as the sinus tarsi approach (STA). The purpose of this study was to examine the postoperative wound-related complications following ORIF for calcaneus fractures between STA and ELA.

Methods: This was a retrospective review of all calcaneus fractures treated with ORIF at a single surgical center. Procedures performed, age, sex, date of injury, date of procedure, wound breakdown, wound infection rate, wound drainage, and time to weight-bearing were collected.

Results: 29 total procedures were identified: 18 ELA procedures and 11 STA procedures. There were non-significant differences in patient age (p=0.06), sex (p=0.61), and BMI (p=0.40) between groups. Time from injury to surgery was also statistically non-significant between ELA and STA approaches (p=0.54). No postoperative wound complications were observed in the STA cohort; there were also no readmissions or reoperations. The ELA cohort experienced a significantly higher rate of postoperative wound complications (50.0% vs. 0%, p=0.004). A total of 11.1% cases, all in the ELA cohort, required reoperation.

Conclusion: Comparison of postoperative wound complications following ORIF for calcaneus fractures between extensile lateral and sinus tarsi approaches demonstrated significantly lower rates of wound drainage, breakdown, and infection requiring reoperation for the STA cohort than the ELA cohort. These findings suggest that the STA approach may reduce postoperative wound complications and the need for reoperation.
David Kim

**The 5-Factor Modified Frailty Index (MFI-5) is Predictive of 30-Day Postoperative Complications and Readmission in Patients with Adult Spinal Deformity (ASD)**

Introduction: This study investigated whether MFI-5 scores can help predict 30-day postop complications, reoperations, or readmissions to identify at-risk ASD pts prior to spinal fusion.

METHODS: Using the American College of Surgeons’ National Surgical Quality Improvement Project (NSQIP), pts with CPT codes for ≥7-level fusion and pts with <7 level fusion with concomitant ICD-9 for spinal deformity were selected from 2008-2016. MFI-5 uses five variables in the NSQIP: CHF, insulin/non-insulin dependent diabetes mellitus, totally or partially dependent preop functional status, COPD history, and HTN requiring medication. MFI-5 groups (score 1-5) were determined, excluding groups with <20 pts. Univariate analysis assessed differences in demographics and preop factors with post-hoc analysis using Bonferroni correction. Logistic regression (LR) was used to assess the correlation of MFI-5 scores with 30-day postop outcomes.

RESULTS: 2,120 pts were included, a majority with a score of 1 or 2 (1: 1058; 2: 949; 3: 113 pts). Most were White (78.8%) and mean age varied across the MFI-5 score groups (1: 45.82 yrs; 2: 62.59 yrs; 3: 65.33 yrs; p≤0.004). Postop pneumonia rates increased with MFI score (1: 1.5%; 2: 3.4%; 3: 8.0%; p<0.05). Pts with an MFI score of 3 had increased 30-day rates of superficial incisional SSI (3.5% vs. 0.8%), stroke (1.8% vs. 0.2%), and shock (1.8% vs. 0.2%) than pts with an MFI score of 1 (p<0.05), but were comparable to pts with an MFI score of 2 (1.9%, 0.7%, 0.6%, p=0.05). Pts with MFI score >1 had increased rates of UTIs (1: 2.0%; 2: 4.7%; 3: 8.8%; p<0.05) and unplanned postop ventilation for >48 hours (1: 0.9%; 2: 3.4%; 3: 3.5%; p<0.05). LR showed an MFI-score of 3 predicted increased 30-day mortality (OR=6.1, p=0.008) and readmiss (OR=2.4; p=0.022).

CONCLUSIONS: This study revealed MFI scores increased with postop individual complication rates and may be a useful tool for preop risk stratification and planning for the short-term postop course.

Matthew Lettieri

**Asymptomatic HIV vs DDD**

Introduction: Spinal fusion (SF) is increasingly used for management of degenerative disc disease (DDD). While the impact of symptomatic HIV disease on postop outcomes is well-reported, showing an increased risk of postop wound and neurologic complications and inpatient mortality following SF, no study until now has evaluated the impact of asymptomatic, well-controlled HIV (AHIV) status on postop outcomes.

Methods: The National Inpatient Sample (NIS) was reviewed from 2005-13 to identify all ≥18y patients who underwent 2-3lvl spinal fusion for the treatment of DDD. Subsequently, those diagnosed with AHIV (ICD V08) were identified and 1:1 propensity score-matched to patients without any HIV disease by age, sex, race, and insurance status. All other HIV diagnoses were excluded, as were surgical indications for other reasons. Univariate comparison of postop medical/surgical/total complications & revisions was performed. Multivariate binary logistic regressions identified independent predictors of these outcomes.

Results: Included: 570 patients (n=285 each). Age, sex, race and insurance status were comparable between AHIV and no-HIV cohorts, as were length of stay (4vs3.8days), total charges ($97,194vs$89,877), and in-hospital mortality (0.4%vs0%), p>0.05. AHIV cohort experienced higher postop respiratory complications (4.3vs0.4%) p<0.05. Yet AHIV and no-HIV cohorts experienced similar overall medical complications (15.8vs13.7%), implant-related complications (0.4vs2.5%), overall surgical complications (3.2vs3.2%), total complications (18.6vs16.1%), all p>0.05. Regression revealed that AHIV status was not an independent predictor for postop respiratory, medical, surgical, or total complications, all p>0.05.

Discussion: Aside from respiratory complications, AHIV status did not adversely impact the overall perioperative course of DDD patients undergoing SF. This data highlights that patients with adequately-controlled HIV infection may be protected from adverse outcomes.
Comparing Neurovascular Presentation and Outcomes Between Gunshot Wound-Induced Humerus Fractures Managed Operatively and Nonoperatively

Introduction: Gunshot wounds (GSWs) to the extremities are commonly managed at trauma centers, yet outcomes are unclear. This study sought to examine patients with GSW-induced humerus fractures to report on injuries, treatment, and complication rates between operative and nonoperative management.

Methods: We retrospectively reviewed all GSW-induced humerus fractures at a level 1 trauma center from 2008 to 2016. 57 patients were identified. Patient demographics, fracture location and AO/OTA classification, operative (n=31) vs. nonoperative (n=26) management, surgical procedures, and pre- and postop complications were collected.

Results: 98.2% of subjects were male and African American. Only AO/OTA C fractures significantly predicted surgical management (p=0.04). Of patients treated surgically, 15 were treated with ORIF (Open Reduction and Internal Fixation), 12 with I&D (Incision & Drainage), 6 with External Fixation, 6 with IMN (Intramedullary Nailing), 1 with osteotomy, and 1 with allograft. 24.6% of patients had nerve deficit of which 84.6% were treated operatively. One operative patient incurred a postoperative nerve complication. 6/11 operative patients were treated for nerve repair. 14% patients with nerve deficit exhibited full recovery and 14% showed partial recovery. Of patients with no recovery, 3 underwent tendon transfer to restore function. 5% of operative had vascular injury to arm vessels. Other complications included DVT (n=1), hardware failure (n=2), and non-surgical-site infections (n=4).

Discussion: In GSW-induced humerus fractures, AO/OTA Type C is a significant predictor of surgical management. Nerve deficits and vascular injury rates at presentation were higher among surgical patients. Only operative patients incurred nerve damage after treatment. Rates of vascular injury and nerve injury were similar to previous studies.

Thirty-Day Outcomes of Upper Extremity Replantation and Revascularization Procedures: An Analysis of the National Surgical Quality Improvement Program Database

Introduction: Improvements in instrumentation and microsurgical techniques have advanced upper extremity replantation and revascularization (UER&R), with high survival rates and excellent functional and aesthetic results. We hypothesized that UER&R procedures may be performed safely with acceptable low rates of 30-day adverse outcomes.

Methods: Utilizing the American College of Surgeons National Surgical Quality Improvement Program database, patients who underwent an UER&R procedure between 2008 and 2016 were identified. Rates of 30-day post-operative complications, reoperations, and related unplanned readmissions were queried from the database and identified.

Results: This study included a total of 326 patients undergoing UER&R. Patients had a mean age of 51 years (18-89 years), were 61.7% male and 38.3% female, and 65.1% white, 16.0% black, and 18.8% other race. Replantation procedures included digit (non-thumb) replantation (3.7%), thumb replantation (3.1%), and hand replantation (0.3%). Revascularization procedures included upper extremity blood vessel repair with vein graft (65.5%) and direct blood vessel repair of the hand and fingers (27.4%). The 30-day complications included intraoperative transfusions (8.0%), failure to wean off the ventilator for greater than 48 hours (2.1%), deep vein thrombosis (1.5%), pulmonary embolism (PE) (1.2%), and pneumonia (1.2%). Reoperation rate was 5.5%, with incision and drainage occurring most frequently (0.6%). Readmission rate was 3.7%, most commonly for PE (0.6%).

Conclusion & Discussion: Our results show that UER&R can be performed with acceptable complication rates in the 30-day post-operative period, which are consistent with studies from single-center series or reports from several centers. Further, the most common complication for UER&R is intraoperative transfusions, which is expected given the 52% rate of transfusions during leech therapy for re plantation reported by Rizis et al., PRS 2011.
**The Impact of Previous Hand/Upper Extremity Surgery on Patient-Reported Outcome Measures: Initial Reporting from the HAND-Q Multicenter Trial**

Hypothesis: We hypothesize that a history of prior surgery would not impact patient-reported measures of hand functionality, treatment satisfaction, symptom severity, and hand appearance.

Methods: 100 patients were prospectively and consecutively enrolled in the HAND-Q at a single-surgeon’s clinic. The HAND-Q, a novel patient-reported outcome measure (PRO) currently in Phase II of a global multicenter validity study, considers factors including functionality, treatment satisfaction, symptom severity, and hand appearance. Composite scores (CS), ranging for 0-100, were collected to measure outcome. Intergroup analysis of outcomes was compared with Pearson’s $\chi^2$ test and two-sample student’s t-test.

Results: A total of 100 patients were enrolled ($n=60$ women; $n=40$ men). Mean age 50 [15-88 yrs]. 37 patients had prior hand surgery and 58 did not. The most common diagnoses were carpal tunnel syndrome ($n=28$) and fractures ($n=28$). Overall difference in hand functionality between surgical (CS=68) and nonsurgical (CS=60) patients was not significant ($p=0.212$), however statistical significance was observed in a subset of questions with surgical patients reporting “severe impairment” at higher percentages. Surgical patients were more satisfied vs non-surgical ($p=0.03$) patients. The CS for overall satisfaction was significantly higher in surgical (CS=94) vs non-surgical (CS=84) groups ($p=0.039$). CS for symptom severity ($p=0.121$), emotional impact ($p=0.322$), and hand appearance ($p=0.471$) showed no statistical significance between the surgical vs nonsurgical groups.

Discussion: Statistical significance was higher in the surgical group vs non-surgical groups in reported satisfaction. Although no statistical significance was observed for overall functionality, two vital functions- wiping and shaking hands are negatively impacted by a history of prior surgery. Moving forward, the HAND-Q should be administered to analyze surgical vs non-surgical management for specific diagnose.

**Gender Disparities in Patient-Reported Measures of the Impact of Hand/Upper Extremity Disease: Initial Reporting from the HAND-Q Trial**

Intro: This study investigated gender disparities in self-reported view regarding the biopsychosocial impact of disease and treatment among hand/upper extremity pts. It was hypothesized there would be no differences b/w genders. The study reports our institution’s data from the Phase II Hand Questionnaire (HAND-Q) Pilot Multicenter International Validation Study.

Methods: All pts. evaluated by the hand/upper extremity service were prospectively enrolled at a single-surgeon’s clinic for participation in the HAND-Q (9/18-1/19). All pts. w/ valid responses to the following were included: symptom severity, hand appearance, txt satisfaction, and emotional impact. Composite scores (CS) were generated via grp. totals on a 0-100-pt scale (symp. severity: 0=none, 100=most severe; appearance: 0=very dissatisfied, 100=very satisfied; emotional impact: 0=never affects emo., 100=always affects emo.; txt satisfaction: 0=def. disagree, 100=def. agree). Bivariate comparison of outcome responses was performed b/w M & F.

Results: Individual questions (IQs) of hand symp. severity showed significant differences w/ M vs. F, while the composite score (CS) showed no diff. b/w grps. (M: $n=31$, CS=47 vs. F: $n=46$, CS=53; $p=0.16$). No diffs. were appreciated b/w M & F respondents for any IQ’s or overall CS pertaining to hand appearance (M: $n=29$, CS=77 vs. F: $n=41$, CS=74; $p=0.60$) and emotional impact of their hand problems (M: $n=29$, CS=57 vs. F: $n=40$, CS=59; $p=0.86$). However, satisfaction CS b/w grps. differed significantly (M: $n=14$, CS=97 vs. F: $n=37$, CS=83; $p=0.017$).

Discussion: Statistically sig. diffs. found b/w the M & F grps. for specific symp. severity q’s and txt satisfaction CS may indicate diffs. in txt expectation b/w genders. Gender disparities were not found in other domains of the HAND-Q. The HAND-Q appears to be a powerful pt-reported outcome measure instrument, as seen in this study on biopsychosocial impact of disease and txt among hand/upper extr. pts.
Recent Smoking History is not Associated with Adverse 30-Day Outcomes Following Replantation or Revascularization Procedures of the Upper Extremity

Background: Cigarette smoking has been associated with complications in wound healing. Upper extremity replantation/revascularization is a complex procedure which requires proper wound healing. This study examines the effects of smoking on 30-day postoperative outcomes following upper extremity replantation/revascularization.

Methods: The American College of Surgeons National Surgical Quality Improvement Program database was queried to identify all patients who underwent replantation procedures of the digit, thumb, hand, forearm, and arm or blood vessel repair of the finger, hand, or upper extremity from 2008-2016. Patients with a history of cigarette smoking within one year prior to surgery (n=89) were compared to those without (n=237). Univariate and multivariate analysis identified risk factors and evaluated their impact on outcomes.

Results: Smokers were younger (45 vs. 53 years, p=0.003), with no differences in sex, race, or BMI. Non-smokers had a higher prevalence of diabetes mellitus (27.4% vs. 16.9%, p=0.048) and were more often on dialysis (32.1% vs. 19.1%, p=0.020). Preoperative lab values were comparable, as were wound class, American Society of Anesthesiologists (ASA) score, operative time, reoperations, readmissions, major and total complications, and length of stay. Smokers required intraoperative transfusions more frequently (14.6% vs. 5.5%, p=0.006). Among all patients, preoperative diabetes was a strong predictor for 30-day reoperations (OR=5.8, 95% Confidence Interval [CI], 1.1-30.4) and Caucasian race was a significant predictor of 30-day major complications (OR=3.3, 95% CI, 1.1-10.2), all p≤0.038.

Conclusions: Smoking history was not associated with increased major or minor complications, readmission, or reoperation rates in the 30-day postoperative period. Among replantation/revascularization patients, diabetes was a strong predictor for 30-day reoperations. The impact of diabetic control on outcomes in this population is worth further study.

Impact of Disease Severity on Patient-Reported Measures of Symptom Severity and Treatment Satisfaction: Initial Reports from the HAND-Q Study

Introduction: This study analyzed self-reported hand appearance, hand symptom severity, and hand treatment satisfaction among patients treated for hand/upper extremity conditions. We hypothesized that these measures would not differ between patients with mild vs. moderate/severe (M/S) disease.

Methods: All patients evaluated by the hand/upper extremity service were prospectively/consecutively enrolled at a single-surgeon’s clinic for participation in HAND-Q. All patients with valid responses to the following were included: hand appearance, problem severity, treatment satisfaction. Composite scores (CS) were generated via group totals on a 0-100-point scale. Bivariate comparisons of responses were performed between disease severity cohorts.

Results: Significant differences between mild vs. M/S disease groups were seen in individual questions regarding hand appearance (p=0.03, 0.03, 0.14) and specific symptom severity related to neuropathy (p=0.03, 0.02). However, no differences were observed between groups in CS for hand appearance (p=0.367) or symptom severity (p=0.714). Significant differences were found between mild and M/S disease groups in individual questions regarding treatment satisfaction (p=0.04, 0.06).

Interestingly, CS comparisons did show significant differences between groups for overall treatment satisfaction (p=0.04). Conclusion: Differences in responses to hand appearance questions in patients with mild vs. M/S disease indicate the potential impact of disease severity on patient self-perception. Significant differences between the mild and M/S disease groups for neurological symptom severity may indicate that patients perceive these symptoms as M/S disease states. The observed difference in treatment satisfaction CS between mild and M/S disease may confirm the need to account disease severity into treatment-planning and counseling to potentially improve treatment satisfaction.
Increases in Fireworks-Related Upper Extremity Injuries Correspond to Increasing Fireworks Sales: An Analysis of 41,195 Injuries Across 10 Years

In 2017, $885 million in consumer fireworks were sold in the United States; this was a 41% increase in firework sales from 2008. In response, the American Society for Surgery of the Hand issued a bulletin urging the public to avoid amateur fireworks. We hypothesized that hand/upper extremity injuries from fireworks were increasing in the United States.

We queried the National Electronic Injury Surveillance System, a nationwide probability sample of injuries related to consumer products, for firework-related upper extremity injuries from 2008-2017. Temporal trends were determined and demographics, injury location, and injury type were collected.

We found 1,079 patients saw 41,195 firework-related upper extremity injuries from 2008-2017. Injuries increased significantly from 2,576 in 2008 to 5,101 in 2017. There was a strong, positive correlation between firework sales and injuries. The majority of injuries were in males (77%). The 11-20 age group represents the highest proportion (27%) injuries followed by the 21-30 age group. Most injuries occurred in summer months. The most common race of injured patients was Caucasian (59%) followed by African-American (7.4%) and Hispanic (5.5%). The most commonly injured body parts were the hand (52.7%) and digits (33.1%). Among finger injuries, the thumb was most commonly injured (31.3%), followed by the index finger (9.7%). Burns were the most common injury across all sites except the wrist where fractures were more common. The other common injuries were laceration (9.3%), fracture (6.5%) and amputation (5%).

In summary, 10-year firework-related upper extremity injuries increased along with increased consumer sales across the same period; most injuries were in young male patients; the hand was most commonly injured, with the thumb as the most injured digit; and combined thumb-index finger injuries were common. These data demonstrate the need to advocate safe firework practices to reduce future injury.

Epidemiology of Female Youth Ice Hockey Injuries Presenting to United States Emergency Departments from 2007 to 2016

Introduction: This study aimed to establish injury incidence rates (IR) by body site, diagnosis, and mechanism using a USA Hockey membership-adjusted population.

Methods: The National Electronic Injury Surveillance System (NEISS) was queried for ice hockey injuries from January 1, 2007 to December 31, 2016. Patients over the age of 18 years (Y) and males were excluded. Comparisons of IR by age were made using a two sample t-test with a 95% confidence interval. Trends were analyzed using linear regression. USA Hockey membership statistics helped establish the population at risk and calculate IR (reported per 10,000 person-years).

Results: A total of 370 patients, representing 9,784 ice hockey-related injuries, presented to NEISS-participating emergency departments. The number of female youth ice hockey players increased significantly from 44,678 in 2007 to 57,792 in 2016 (R²=0.89, β=0.94, p<0.001). The IR of injuries fell from 222.1 to 177.4 (p=0.30). Commonly injured body parts were the head (n=2,807, IR=56.4), trunk (n=1,399, IR=28.1), knee (n=1,110, IR=22.3), shoulder (n=704, IR=14.1) and ankle (n=591, IR=11.9). Common diagnoses included strain/sprain (n=1,843, IR=40.2), contusion (n=1,709, IR=34.3), internal organ injury (n=1,699, IR=34.1), concussion (n=1,035, IR=20.8) and fracture (n=1,240, IR=24.9). The top mechanisms of injury were player-to-player contact (n= 3,103, IR=62.3), falls (n=2,188, IR=43.9), and contact with boards (n=810, IR=16.3). The player-to-player mechanism of injury increased with age: 0-8Y (IR=2), 9-10Y (IR=32.1), 11-12Y (IR=53), 13-14Y (IR=120), 15-16Y (IR=138.3) and 17-18Y (IR=204.6). Head injuries increased with age: 0-8Y (n=15, IR=1), 9-10Y (n=153, IR=17.4), 11-12Y (n=598, IR=67.2), 13-14Y (n=885, IR=115.1), 15-16Y (n=650, IR=121.6) and 17-18Y (n=506, IR=157.5).

Conclusions: Player-to-player contact was the leading mechanism of injury in all but the 0-8Y age division. Body checking is a major contributor to the game’s injury burden.
The Impact of Baseline Patient Factors on Complication Rates Following Three Surgical Options for Management of Proximal Humerus Fractures in Elderly Patients

Introduction: This study aimed to compare non-operative, shoulder arthroplasty (SA), hemiarthroplasty (HA), or open reduction and internal fixation (ORIF) treatments for proximal humerus fractures in patients over the age of 65.

Methods: The American College of Surgeons National Surgical Quality Improvement Program (NSQIP) database identified all patients who underwent SA, HA, or ORIF for proximal humerus fractures between 2011 and 2016. Patients 65 years or older were grouped into SA, HA, and ORIF cohorts. Demographics, comorbidities, preop laboratory values, and 30-day major, minor, and total postop complication, readmission and reoperation rates were compared.

Results: 1,257 patients were identified: SA, n=259; HA, n=238; and ORIF, n=760. The mean patient age who underwent SA (77.4) was significantly higher than of HA (76.14) or ORIF (75.23). The SA cohort had a higher proportion of Caucasians than HA or ORIF (p=0.009); the distribution of African Americans also differed significantly. Patients undergoing SA had significantly higher rates of diabetes (p=0.035) as well as higher BMI than either HA or ORIF cohort (p=0.001). There was no significant difference in rates of procedures (p>0.05), reoperation (p=0.184) or readmission (p=0.933). Preoperative albumin levels below 3.5g/dL was a significant predictor of major (OR=4.6, p=0.007) and minor (OR=2.5, p=0.017) 30-day postoperative complications, and rate of readmission (OR=2.19, p=0.037).

Discussion: In elderly patients with proximal humerus fractures, ORIF was the most common procedure. SA patients were older, more medically complicated, and obese compared to those undergoing ORIF or HA. Low preoperative albumin was a significant predictor of 30-day postoperative complications and 30-day readmissions.

The New 5-Factor Modified Frailty Index (MFI-5) is Predictive of 30-Day Postoperative Complications and Readmission in Patients Undergoing Shoulder Arthroplasty

Introduction: Given the lack of literature concerning the association of the modified 5-item frailty index (mFI-5) with outcomes in the shoulder arthroplasty (SA), we sought to: (1) characterize the population undergoing SA and the rate of 30-day complications; and (2) determine whether the mFI-5 was a predictor of 30-day complications, readmissions, and reoperation in order to provide a pre-operative risk stratification index.

Methodology: The National Surgical Quality Improvement Project (NSQIP) was queried from the years 2008 â€“ 2016 for patients who underwent SA. The mFI-5 utilizes congestive heart failure, diabetes mellitus, functional status, COPD, and hypertension. Demographics were collected, and univariate analysis with chi-square and ANOVA were conducted. Multivariate analysis with binary logistic regression was used to calculate odds ratios and assess the correlation of the mFI-5 with 30-day outcomes.

Results: 14,526 patients met inclusion criteria. The mean age was 69.01 years and the majority of patients (85.3%) identifying as White. The majority of patients (51.0%) received an mFI-5 score of 2. Complications were infrequent following SA; urinary tract infections were the most common complication (0.8%), with pneumonia as the second most (0.5%). 30-day mortality occurred in 0.2% of the population.

mFI-5 score was associated with increased complications, with mFI-5 scores of 2, 3, and 4 resulting in 1.8, 2.4, and 4.8-times the odds respectively (p<0.001) and readmissions related to SA, with mFI-5 scores of 2, 3, and 4 with 2.0, 3.2, and 9.7-times the odds respectively (p<0.001).

Discussion: mFI-5 demonstrated a strong association for readmission as well as complications in the 30-day postoperative period following shoulder arthroplasty.
The Dubousset Functional Test: A Baseline Analysis of a Novel, Multi-Domain Assessment of Physical Function and Balance

Introduction: Our ability to assess a patient’s spinal function and maintenance of body balance is lacking an objective and quantified mechanism of assessment. Therefore, this study sought to assess the feasibility and establish baseline values for the Dubousset Functional Test (DFT), a simple multi-domain functional and balance assessment tool, in an asymptomatic population.

Methods: Asymptomatic volunteers were screened and recruited to participate in the 4 DFT components. These include: (1) UWT (Up-and-Walking Test): unassisted sit-to-stand, walk forward/backward 5m (no turn), unassisted sit; (2) ST (Steps Test): ascend 3 steps, turn, descend 3 steps; (3) DST (Down-and-Sitting Test): stand-to-ground sit-to-stand, assistance as needed; (4) DTT (Dual-Tasking Test): walk 5m forth and back while counting down from 50 by 2. All subjects were given standardized verbal instructions and demo prior to each DFT test. Trials were video recorded and timed. Univariate and multivariate analysis were utilized to analyze durations of test components against demographics.

Results: Included: 65 asymptomatic volunteers (mean age: 42.4±15.4 yrs; 42% female, mean BMI 26±4.8kg/m2). Mean duration of each DFT test: UWT: 14.8s, ST: 6.3s, DST: 6.0s, and DTT: 12.8s. Significant correlations were observed between age and duration of DST (r=0.53), UWT (r=0.43) and ST (r=0.36). A similar trend was observed for DST, UWT, and ST correlation with BMI (r=0.37, r=0.29, r=0.37), all p<0.05. No correlations were found for DTT. 32.3% of subjects exhibited verbal pausing/mistakes in counting during the DTT; 62% occurred while turning.

Discussion: The DFT was feasible, safe to perform and could be completed in normal volunteers in about a minute, though it took longer in older patients and patients with higher BMI. Normative reference ranges were established and may assist surgeons in determining deviations in functional status and understanding the impact of preop DFT performance on postop outcomes.

Validation of a Novel Rabbit Model of Compression Neuropathy in the Setting of Perineural Adhesion

Introduction: Nerve injury initiates inflammation that can lead to compression neuropathy and nerve stretching, causing pain and nerve dysfunction. Rabbit models closely mimic human biology, yet no validated rabbit model exists for study of compression neuropathy. This study sought to develop a novel, rabbit model to simulate compression neuropathy secondary to perineural adhesion.

Methods: Sciatic nerves of five, 3-4kg New Zealand White Rabbits were surgically-exposed via longitudinal incision at the posterolateral thigh. Control hindlimbs underwent sham surgery. Perineural adhesions were generated, and the epineurium was fixed with microsuture to the wound bed. Exposure of the sciatic nerve was performed bilaterally, with proximal and distal nerve transection, at which point peak pull-out force (Newtons) required to break adhesions was measured and compared using unpaired Wilcoxon’s rank sum test. Tibialis anterior (TA) muscles were harvested bilaterally, and muscle mass was compared.

Results: When nerves were pulled at a rate of 29 mm/min with 0.005 N pre-loading, scarred nerves required greater peak pull-out force than control (2.51 N vs. 0.50 N, p=0.021). TA muscle mass was significantly lower in the setting of induced neuropathy when compared to control (6.56 g vs. 8.52 g, p<0.001).

Conclusion: Given the close mimicry of human neuroregenerative and immunological biology in rabbits, we developed and validated a model to simulate compression neuropathy, demonstrated by the significant reduction in TA mass in experimental hindlimbs and formation of significant perineural scar. Additionally, we created a novel means to measure peak pull-force required to break perineural adhesions.
The Efficiency of Global Longitudinal Strain and Ejection Fraction in Measuring Left Ventricular Mass

Background: Congestive Heart Failure (CHF) is a condition that occurs when the heart is unable to pump blood efficiently. Left Ventricular Mass (LVM) is the primary indication of CHF. Global Longitudinal Strain (GLS) measures the change in distance between the speckles of the heart. Ejection Fraction (EF) measures the input and output of blood. EF is the “gold standard” used to measure CHF, while GLS is a new measurement that can be used to better the outcome of patients.

Objective: To detect which method, (GLS) or (EF), is more effective in recognizing left ventricular mass.

Methods: The sample consisted of 38 Black patients recruited from Dr. Lazar’s clinic. While patients completed a stress test, the performance of the heart was recorded. LVM was calculated by finding the distance between the lengths of the cavity size (LVEDD), interventricular septum distance (IVSD), and the posterior wall thickness (PWI). EF percentage was calculated from EF pre and EF post. A Spearman’s correlation coefficient was used to evaluate (1) GLS vs. LV mass and (2) EF vs. LV mass. A Fisher’s r to Z transformation was then done to compare the correlation between GLS and LV mass to the correlation between EF and LV mass, to evaluate whether GLS or EF is a better predictor of LV mass.

Major Results: Spearman’s correlation coefficient for GLS vs. LV mass was -0.139 (p-value = 0.405). Spearman’s correlation coefficient for EF percentage vs. LV mass was 0.159 (p-value = 0.341). Both correlations were not statistically significant.

Observed=0.086, (p-value=0.93) indicated no significant difference between GLS and EF in predicting LV mass.

Conclusion: Based on our results, the data showed that neither EF nor GLS were significantly better at predicting LV mass, because the p-value is greater than 0.05. The limitations of the study included small sample size and was only restricted to one location.

The Association between Gender, Diet and Physical Activity in Central Brooklyn Adolescents with Obesity

Background: Obesity among children, ages 12-18, is an epidemic in the United States and is a critical problem. Obesity is a general term for a person with excess body fat in comparison to height and weight. It can lead to diseases such as diabetes, chronic kidney diseases, high blood pressure, and high cholesterol. Factors such as diet and physical activity play a major role in obesity prevention.

Objective: To analyze the association between gender, diet and physical activity in obese Central Brooklyn adolescents.

Methods: Participants were adolescent patients (12-18 years old) accompanied by a parent or guardian, recruited from Downstate Pediatric Associates and related sites in Central Brooklyn. Surveys were administered anonymously via iPad and participants received two $11 metrocards as an incentive for survey completion. Patients with mental disorders and non-English speakers were excluded from the study. The sample population (n=73) consisted of majority Black-African Americans (86.1%) and females (60.3%). The average age was 14.31 years. Chi-square analysis using SPSS 24 software was done to evaluate the association between gender, diet, and physical activity.

Major Results: There was no significant association found between gender and the consumption of fruits, vegetables, and sweetened beverages. There was a statistically significant difference between females and males with obesity in regards to days spent per week exercising for 1 hour (p < 0.05). Specifically, more males (72%) exercised 3 or more days per week compared to females (49%).

Conclusion: The results partially supported the hypothesis. Due to a small sample size, mostly female, results cannot be generalized. While the published literature supports a significant difference between the general female and male adolescent population in dietary practices, we found no difference between genders in regard to dietary practices in our sample population.
Roudjessie Charles, Zoe Montgomery  
Advisor(s): Mary Valmont

**The Relationship between Fractal Dimension Complexity and Rate of Blood Flow**

**Background:** Congestive Heart Failure (CHF) is a disease that affects the heart’s ability to efficiently pump oxygen rich blood through the body. If blood is pumping insufficiently, fluids build up in the heart causing “heart failure” even though the heart is still beating. Structurally, blood vessels and trees are similar, they have a mother branch that breaks off into smaller and smaller branches called “daughter branches.”

**Objective:** Examine if there is an association between fractal dimension complexity (FDC) and Thrombolysis in Myocardial Infarction (TIMI) flow rate. Being able to predict the pressure and rate of blood flow at any point of the artery will better help physicians to understand arterial structure.

**Methods:** An angiogram was conducted on 37 patients who had symptoms of CHF. A catheter was inserted into the femoral artery up to the aorta where dye was injected. ImageJ software (a platform for scientific image analysis developed by the National Institute of Health) was used to count the total number of frames taken to fill up the blood vessel. With each frame corresponding to 1/15th of a second, total fill time was then calculated. The TIMI Score is used to determine the likelihood of ischemic events, or mortality in patients with unstable angina. A linear regression test was used to evaluate the correlation between FDC and blood flow rate.

**Major Results:** Spearman’s correlation is equal to -0.8, indicating a strong negative correlation. With a p-value of 2.0910-9 the correlation is statistically significant. With an r2 value equal to 0.769,76.9% of variability in rate of blood flow is attributable to FDC.

**Conclusion:** There is a statistically significant relationship between fractal dimension and flow time, (p-value<0.001). Our results indicate a strong negative correlation between FDC and the rate of blood flow. FDC can possibly be used to help analyze rate of blood flow. This would provide less intrusive ways of measuring heart health.

Tyra Andrus, Cassandra St. Louis  
Advisor(s): Mary Valmont

**The Relationship between Socioeconomic Status and Change in PrEP Knowledge among Customers of Barbershops & Salons**

**Background:** Over time the human immunodeficiency virus (HIV) weakens the immune system’s white blood cell CD4-T. Central Brooklyn’s Bedford, Stuyvesant and Crown Heights neighborhoods have some of the highest HIV mortality rates indicating a great need for intervention. Gilead’s Ready, Set, PrEPare project uses an unconventional method to train hair stylists and barbers to deliver information on Pre-Exposure Prophylaxis (PrEP). PrEP is a medication for HIV negative individuals who are considered at high risk for HIV infection.

**Objective:** To examine the relationship between PrEP knowledge and socioeconomic status (SES) variables: health insurance, education, income, employment.

**Methods:** Trained advocates (barbers and hair stylists) administered pre-assessment surveys to customers. Three months later, customers were called and given post-surveys to evaluate change in PrEP knowledge. A McNemar’s test was used to compare customers’ PrEP knowledge before and after intervention. Chi Square analysis was used to evaluate the association between socioeconomic status and customers’ accurate knowledge of PrEP.

**Major Results:** Our results demonstrated a significant change in pre-to-post knowledge on PrEP in four of the six variables, suggesting that Ready, Set, PrEPare, is effective in educating the community. Of the four SES variables, only employment was associated with a significant difference in number of questions answered correctly.

**Conclusion:** The data partially supports our hypothesis. Four of the six variables evaluating PrEP knowledge were significant. Three of the six show a positive change in knowledge; one of the six shows a decrease in knowledge. Future research should find the association between SES and PrEP knowledge across varying socioeconomic levels.
Vaping in the Pre-adolescent and Adolescent Population

Since the introduction of Electronic Nicotine Device Systems (ENDS) in the early 2000s, there has been a decline in cigarette smokers from “1.14 billion then to about 1.1 billion” (Jones, 2018). However, there has been an increase in vape users from “about seven million in 2011 to 35 million in 2016” (Jones, 2018). The recent dramatic increase in the use of Electronic Nicotine Devices (ENDS) in the pre-adolescent and adolescent population is well-documented by the Surgeon General of the U.S. and the Centers for Disease Control (CDC). The Surgeon General (2016) reports that E-cigarettes are now the most commonly used tobacco product among youth in the United States. In terms of nicotine, ENDS are equivalent to, if not just as harmful as, conventional cigarettes. Although nurses may be well prepared to assist with smoking cessation, they may not be well prepared to address vaping especially among adolescents. This study will help determine whether health care providers are well informed and knowledgeable about vaping, the effects on respiratory health, respiratory-related illness and quality of life with respect to addictive behaviors in pre-adolescents and adolescents. The proposed pre-test-post-test, quasi-experimental study will use a convenience sample of 50 nurse practitioner students currently enrolled in a master’s program at an urban university. An investigator designed pretest will assess knowledge, skills and attitudes about vaping and interventions and prevention. After the pretest, the students receive a one-hour class about vaping. A post-test will be administered three months later to determine care providers’ knowledge of vaping and its effects on pre-adolescents and adolescents, and appropriate interventions. It is anticipated that, with education, health care providers will be better equipped to screen and provide information regarding vaping and smoking, resulting in a decrease in vape usage.

Argatroban Refractory, Heparin Induced Thrombocytopenia After Coronary Intervention with Radial Artery Occlusion

Heparin induced thrombocytopenia (HIT) is threatening disorder that occurs in a small percentage of patients following exposure to heparin. HIT can further be classified into two types: HIT type 1 and type 2. Type 2 HIT is a life threatening and clinically significant outcome, which presents with thrombocytopenia and evidence of thrombus formation in the presence of antibody formation. Additionally, severe variations of HIT exist, including delayed onset HIT and refractory HIT, known collectively as autoimmune HIT (aHIT). Here we discuss a case of delayed onset and refractory HIT in a patient with little heparin exposure, discovered only after cardiac intervention for suspected STEMI. Significant thrombotic events occurred thereafter, including radial artery stenosis and intracardiac thrombus. Treatment with argatroban was insignificant. Significant resolution of thrombocytopenia was seen several weeks after infusion with IVIG, thus depicting further suspicion for refractory HIT. IVIG for aHIT treatment is traditionally chosen only if the disease process is refractory to other anticoagulation efforts due to the potential risk for increasing thrombotic risk with IVIG infusion. Here we discuss further the rare presentation of aHIT and the use if IVIG to successfully treat thrombocytopenia in refractory HIT.
**Effects of Lower Body Positive Pressure Ambulation on Functional Capacity in Patients With Severe Congestive Heart Failure**

Congestive heart failure (CHF) with reduced ejection fraction is a progressive disorder that poses significant morbidity and mortality. In addition to advances in medical and device therapy leading to improved outcomes, exercise remains an overlooked but effective treatment modality in such patients as aerobic activity has consistently shown to reduce the risk of hospital admissions and to improve health-related quality of life. However, the dilemma is that patients who could potentially derive the most benefit are the least able to exercise. NASA developed a lower body positive pressure (LBPP) treadmill that offloads up to 80% of wt. allowing comfortable walking for disabled people. We prospectively studied 8 subjects with severe CHF (New York Heart Association Class (NYHA) 3-4 symptoms) and reduced ejection fraction on optimal medical therapy, walking <300 meters on a 6 minute walk test (6MWT) as part of their clinical workup. Repeat 6MWT was performed after 3 and 6 weeks. There were 6 men and 2 women, age 64±12 years, mean ejection fraction 26±5%. Subjects underwent 2-3 low amount, low intensity 30-min. weekly sessions at 40% unloading (to 60% of body weight) for 6 weeks. Sessions were well tolerated and resulted in a significant increase in 6 minute walk distance from 166±66 to 208±92 to 288±153, p<0.01) over the 6 week period. In conclusion, this pilot study demonstrated that repeated sessions of LBPP treadmill ambulation significantly improved functional capacity in patients with severe CHF.

**Is Spinal Cord Area Related to Cardiovascular Risk?**

Aging is associated with declining brain, which may be accelerated in individuals with cardiovascular (CV) risk factors such as hypertension. Lower brain volume is in turn associated with cognitive impairment. Since cognitive impairment and frailty often coexist, brain and spinal cord (SC) atrophy might be related and share a common underlying pathophysiology. Although few studies have found brain atrophy associated with frailty, little is known about the impact of aging and CV risk factors on the SC. Therefore, the objectives of this study were to determine the relations of SC size to age and overall CV risk. We retrospectively chart reviewed 122 patients, age 61±9 years, 77.5% female who were referred to our institution for Magnetic resonance imaging (MRI) of the cervical SC from June 1, 2017 to March 1, 2018. CV risk factors were obtained from an electronic medical record and the pooled cohort risk (PCR) score, which predicts the 10-year risk of first atherosclerotic cardiovascular event, was assessed using the American College of Cardiology PCR calculator. Patients with degenerative neurological disease were excluded from the study. The SC area were traced with electronic calipers and averaged. Among the 71 patients who had complete data on cardiovascular risk factors, age (beta=0.24) and the PCR score (beta=0.45) were each significantly correlated inversely with mean spinal cord area (SCA) (both p<.05). On multivariate analysis, only PCR score was independently associated with SCA. The relation between PCR score and SCA appears to be mediated by age (B=-0.28, p=0.018) and diabetes (Beta=-0.44, p=0.000). In conclusion, SCA is related to cardiovascular risk with age and the presence of diabetes accounting for the relation. These data suggest a vascular etiology for sc atrophy.
Ganesh Keshav Thirunavukkarasu

Cardiac amyloid presenting as Recurrent Syncope

Introduction: Transthyretin amyloid cardiomyopathy (TTR-ACM) is the most commonly described infiltrative heart disease that mimics hypertensive or hypertrophic heart disease and often goes undiagnosed, especially in Black patients.

Case: A 79 year old AA male with hypertension presented after witnessed recurrent syncopal episodes without evidence of seizure. Physical exam was unremarkable. ECG showed sinus bradycardia 50 bpm, with nonspecific ST-T abnormality, normal voltage. CT head was normal. Chemistries and renal function were normal. Troponin I and BNP were elevated. Urine-protein electrophoresis (PEP) was normal, but serum-PEP had a monoclonal IgG lambda gammopathy(0.3g/dL). 2D-echo demonstrated LVEF of 40-45%, diastolic (grade 1) dysfunction, dilated atria and speckled pattern of the myocardium. CT coronary angiogram was normal. Tc-99m pyrophosphate (PYP) scan revealed intense bi-ventricular uptake. Fat pad biopsy-negative for amyloid. Loop recorder revealed intermittent atrial fibrillation. Patient was referred to Weill-Cornell hospital for follow up.

Discussion: Amyloid deposition can affect the myocardium, atria, pericardium, endocardium, and vasculature leading to heart failure and arrhythmias. Three types of cardiac amyloidosis are recognized: light chain (AL), hereditary (ATTRm) and wild-type (ATTRwt). Intense uptake in Tc-99m PYP scintigraphy in the absence of serum or urine monoclonal protein can provide a diagnosis of cardiac ATTR amyloidosis with 100% specificity precluding a need for biopsy. In our case, given both monoclonal gammopathy and intense Tc-99m PYP uptake, endomyocardial biopsy is necessary for guiding therapy.

Conclusion: Given disproportionately increased prevalence of ACM in Black patients, hypertrophic heart disease after 6th decade should include amyloid work up. Clinicians need to be aware of the utility and easy availability of Tc-99m PYP cardiac scintigraphy to help diagnose cardiac amyloid, especially in view of emerging therapies.

Tobin Mathew

Relation Between Dynamic Nailfold Capillaroscopy And Digital Thermal Reactivity Testing To Assess Microvascular Function In Diabetic And Nondiabetic Patients

Although microvascular disease has been increasingly implicated in the pathogenesis of cardiovascular disease, there remains no gold standard test to assess its extent. Currently, several methods exist to measure including digital thermal monitoring (DTM), providing a vascular reactivity index. Nailfold capillaroscopy (NFC) is a non-invasive imaging technique long used in the clinical rheumatology arena, that has recently been advocated for use in non-rheumatology conditions. These two tests provide subclinical measures of structure and function at the microvascular level but have not been compared. Accordingly, the objective of this study was to directly compare values obtained by NFC with DTM. We studied 17 non-diabetic subjects and 11 diabetic subjects, five of whom had known microvascular complications (retinopathy, neuropathy, or nephropathy) and assessed capillary number via NFC and vascular reactivity (Vendys). Vascular reactivity was significantly correlated with mean capillary number (r=−0.40, p=0.036). Mean vascular reactivity was lower in the diabetic group (.37 ± 0.36 and 0.90 ± 0.61; p=0.008) and there was a trend towards lower mean capillary number in the diabetic group (7.13±1.21 and 8.04±1.01, p=0.04). In conclusion, preliminary findings from this ongoing study suggest that capillary structure assessed by NFC and microvascular reserve assessed by DTM appear to be related. Diabetic patients appear to exhibit both structural and functional abnormalities, even in patients without known microvascular complications.
The Dynamic Nature of CHA2DS2VAS Score in Minority Patients with Atrial Fibrillation.

Introduction: Atrial Fibrillation is the most common sustained arrhythmia and is a well-established risk factor for strokes and transient ischemic attacks (TIAs). The CHADS and CHA2DS2VASc scores have been validated to predict stroke risk and thus indication for anticoagulation in these patients.

A recent study expressed that there is evidence to suggest that stroke risk in atrial fibrillation is dynamic. In addition to increasing their age on follow up, patients are likely to accumulate other risk factors that increase their stroke risk.

Goals: We seek to determine the dynamism of stroke risk in a US minority population.

Methods: We conducted a single-center, retrospective chart review of the hospitals electronic medical records (EMR) for all patients admitted to the telemetry service with Atrial Fibrillation between the months of October and December 2018. We assessed the CHA2DS2VASc score at visit as well as 1, 3 and 5 years prior. Patterns of anticoagulation prescriptions by inpatient providers were also noted in addition to the incidence of strokes in the five year follow up period.

Results: Of 218 patients admitted to the telemetry service in the 3 month period, 69 had Atrial fibrillation, 11 of which were new-onset (15.9%). 62 patients (89.9%) of patients were of African ancestry.

52, 43 and 38 patients had documentation in the electronic medical record, going back 1, 3 and 5 years respectively. On comparing CHA2DS2VASc scores at the time of admission to 1, 3 and 5 years prior we noted that there was a change in risk in 11 (21.2%), 20 (46.5%) and 25 (65.7%) patients respectively.

5 years prior, there were 4 patients with a score of 0-1, three of which accumulated a new risk factor during follow up. Of all patients followed, 4 (5.8%) had a stroke during the follow up period.

Conclusion: In our predominantly African American cohort of patients, we noted that stroke risk is very dynamic and thus should be assessed at least annually given our findings.

Improving Compliance and Follow-Up for Chemotherapy-Induced Heart Failure in an Urban Underserved Tertiary Hospital

Chemotherapy-induced cardiomyopathy and heart failure are major complications of cancer therapy and can result in significant morbidity and mortality. Underserved areas have been found to have higher incidences of poor compliance and follow-up. At Kings County Hospital Center, a major academic cancer treatment center in Brooklyn, NY, our findings indicate that over the past five years, many patients with chemotherapy-induced cardiomyopathy were lost to follow-up with outpatient cardiology services. This led us to develop and apply a new collaborative protocol focused on detecting and managing type I or type II chemotherapy-induced cardiotoxicity. The first step of the protocol involves obtaining a multigated acquisition (MUGA) scan of the patient, prior to beginning chemotherapy and during every three months of chemotherapy treatment. If a 10% or more reduction in ejection fraction is found between MUGA scans, the reading physician is to notify the Heart Health Center at Kings County Hospital to contact the patient for an appointment. At the Heart Health Center, the patient is to receive guideline-recommended treatment for heart failure; follow up with the nurse practitioner for medication reconciliation, counseling on activity, weight monitoring, dietary intake, and warning symptoms for heart failure exacerbations; follow-up with a nutritionist for guideline directed dietary recommendations for heart failure; and follow-up with social work services to ensure appropriate social conditions and support. The oncology service would also assist by checking for cardiology follow-up, before continuing chemotherapy. If the patient has not, or was lost to follow-up, the oncology service would notify the Heart Health Center that would also attempt to reach the patient for further appointments. We aim to improve compliance for follow up and guideline directed management for chemotherapy-induced heart failure in an urban underserved tertiary hospital.
Rishard Abdul

**Right Ventricular Infarction Complicated with Pulmonary embolism**

Introduction: Since the introduction of heparin as part of the management of acute coronary syndrome, the occurrence of pulmonary embolism (PE) as a complication of myocardial infarction (MI) has somewhat been unheard of. Given this rarity, its recognition is now a formidable challenge.

Case Description: We highlight a case of a previously well 56-year-old male who presented with typical chest pain radiating to the left arm and dizziness. Initial vital signs revealed a blood pressure of 95/65 mmHg and his heart rate was 42 bpm. Physical examination revealed a middle-aged male in no acute distress with cool extremities, normal heart sounds, no murmurs and flat neck veins. His chest was clear to auscultation, abdomen benign and clinically, he was euvolemic. His first electrocardiogram (EKG) was significant for bradycardia with heart block and junctional escape rhythm with ST depressions in the anteroseptal leads. Subsequent right sided EKG showed sinus bradycardia with ST segment elevations in leads II, III and aVF. Troponin I was 0.95 ng/L [normal <0.04 ng/L] and initial transthoracic echo (TTE) was unremarkable with an ejection fraction (EF) of 55-60%. He was given loading doses of aspirin and clopidogrel, heparin drip initiated, and he proceeded to cardiac catheterization which revealed a 60 % stenotic lesion of the mid LAD and a large filling defect consistent with thrombus. Post procedure TTE revealed an EF of 40%, septal and posterior hypokinesis, right ventricular regional wall motion abnormality of the basal and mid free wall with apical hypercontractility (McConnell's sign) suggestive of PE. CT pulmonary angiography revealed bilateral pulmonary emboli and anticoagulation therapy was initiated.

Conclusion: This case illustrates that pulmonary emboli is a potential complication of RV infarction and its identification critical, as anticoagulation therapy becomes a requirement.

Mohammed Elshorafa

**Psychogenic Non-Epileptic Seizures: The Mistaken Diagnosis**

Objective: To report a case of frontal lobe epilepsy that was previously attributed to psychogenic non-epileptic seizures (PNES) and evaluate the disparity between these two diagnosis.

Background: The line between epileptic and PNES can be very thin due to similar presentations. In practice, seizures are widely accepted to be a clinical diagnosis and although a number of features have been reported to help distinguish these two entities, it is difficult without the use of video-EEG monitoring. Even then, the semiology of said events share features with frontal lobe seizures, which at times can also pose a diagnostic challenge given the difficulty with identifying focal discharges on EEG due to their deep cortical origin. In addition, epileptic seizures and PNES are not mutually exclusive diagnosis as they can often occur together.

Design/Method: We present a case of a 14 year old girl with events that are clinically consistent with frontal lobe seizures in both sleep and awake state. These episodes were attributed to PNES without medical treatment for almost two years prior to our initial evaluation.

Results: Workup included a prolonged video EEG study which was completed in our Epilepsy Monitoring Unit for five days. The ictal onset was a brief burst of rhythmic beta activity over the right parasagittal region, that was quickly followed by diffuse EMG artifact obscuring the EEG and this was consistent with all the recorded events. Once identified, she was started on Tegretol which reduced the number of episodes. At her subsequent follow up appointment one month later she endorsed not having any further events.

Conclusion: We described a young lady with clinical frontal lobe seizures that were previously attributed to PNES. This case represents the variable presentations of frontal lobe seizures, the difficulty with which to identify definitive ictal patterns on EEG and the importance of a comprehensive overview to evaluate patients with suspected PNES.
Starlyn Adames  Advisor(s): Jasmin Thomas

**Developing the pilot program: Emotional Intelligence: Soft Skills Training Curriculum, an educational training for students during Fieldwork Level I and Fieldwork Level II**

Emotional intelligence (EI), or soft skills, is a set of skills such as professionalism, effective communication skills, organizational skills, and responsivity to feedback. Research indicates that occupational therapy students entering their Level I and II Fieldwork experiences may lack these sets of skills. The lack of these soft skills during fieldwork experience can strain the fieldwork student’s professional relationship with their clinical educators (supervisors) and result in fieldwork failure. After a review of the literature, the purpose of this research project is to augment the evidence-based, soft skills training curriculum being developed at SUNY Downstate Medical Center through the production of three educational videos that incorporates the perspectives of fieldwork students, alumni, and clinical educators. The goal of the project is to teach current students soft skills and inspire self-awareness and reflection on their own professionalism. The curriculum would ideally function to increase students success in fieldwork and develop more competent clinicians.

Theresa Sexton  Advisor(s): Ian deSouza

**Pharmacologic Cardioversion of Recent-Onset Atrial Fibrillation and Atrial Flutter: A Systematic Review and Network Meta-analysis**

Background: Atrial Fibrillation (AF) is the most common clinically significant dysrhythmia worldwide and is associated with increased risk of thromboembolism and cardiovascular death. In patients with recent-onset AF, early cardioversion may reduce these risks.

Objectives: We conducted a systematic review and Bayesian network meta-analysis of randomized controlled trials to indirectly compare and rank antidysrhythmic drugs for pharmacologic cardioversion of recent-onset AF and atrial flutter (AFL) in adults.

Methods: We searched PubMed, Embase, and Web of Science from inception to November 2018 and appraised selected trials for risk of bias using the Cochrane review handbook. We extracted data and calculated odds ratios for the outcomes of conversion within 24 hours. We qualitatively assessed rate of significant adverse events, time to cardioversion, and rate of thromboembolism.

Results: We selected 29 studies comprising 3,478 patients across 18 treatment groups. There was unclear risk of bias across the studies. Networks were limited by number of trials and available direct evidence. Probabilistic analysis ranked ranolazine PO plus amiodarone IV highest for conversion within 24 hours.

Conclusions: For pharmacologic cardioversion of AF within 24 hours, ranolazine PO plus amiodarone IV may be the superior drug regimen. Flecaïnide IV/PO and vernakalant IV may be effective alternative agents. Propafenone IV/PO and amiodarone IV may be relatively less effective. Due to limited evidence, we cannot offer any recommendations for pharmacologic cardioversion of recent-onset AFL. Additional high-quality, placebo-controlled, and head-to-head studies are necessary in order to make definitive recommendations for the pharmacologic cardioversion of recent-onset AF and AFL.
BRASH Syndrome case Report

Introduction: BRASH syndrome (Bradycardia, renal failure, AV node block, shock, hyperkalemia) is a newly described entity. It presents with profound bradycardia and AV block that is not proportional to the rate controlling medication use or their hyperkalemia alone. EKG findings are not typical of hyperkalemia and symptoms are refractory to positive chronotropic medications.

Case: An 89 year old female with hypertension and chronic kidney disease presented with bradycardia of 17 bpm and decreased responsiveness. Medication history included Metoprolol and a diuretic. EKG showed 3rd degree heart block without characteristic QRS widening or T-wave changes. First line treatment with atropine and then glucagon failed to correct the heart rate. An external pacer improved the patient’s hemodynamics and mental status. Labs revealed a creatinine 4, and potassium 6.6. Intravenous fluid and calcium increased her heart rate to 105, enabling removal of pacer.

Discussion: The bradycardia is multifactorial, caused by cardiac and kidney disease and beta blocker. Hypovolemia potentiates the hyperkalemia. The low volume state cannot be compensated with an increase in heart rate due to medication induced AV-blockade leading to bradycardic cardiogenic shock. This decreases kidney perfusion and worsens the hyperkalemia, which synergizes with AV-blocking agents causing increasing nodal blockade even at relatively low potassium levels, explaining why typical EKG findings associated with hyperkalemia (tall peaked T-waves, widening QRS, etc.) are often absent in BRASH syndrome.

Conclusion: The symptoms are caused by a correctable electrolyte derangement and because the etiology of the bradycardia is metabolic rather than cardiac, following the ACLS bradycardia algorithm will not correct the cause of the bradycardia. Treating the electrolyte abnormality, even in the absence of characteristic hyperkalemic EKG findings, with fluid replacement can lead to dramatic improvement in the patient.

The Utility of Interval Likelihood Ratios of Lactate to Predict Mortality

Background: Several cutoff values for lactate have been proposed to aid in directing resuscitation efforts across various disease states given its relevance as a marker of end organ perfusion and its association with in-hospital mortality. This study was designed to determine if interval likelihood ratios for lactate could provide improved clinical significance as a predictor of in-hospital mortality when compared to use of a typical dichotomous cutoff.

Methods: A database of patients at the University Hospital of Brooklyn was created for those that received a lactate level drawn in the emergency room. Receiver Operator Characteristic (ROC) curves were created to calculate the Area Under the Curve (AUC) for the ability of lactate to predict death. Interval likelihood ratios (LR’s) for lactate predicting mortality rate were also calculated, and Bayes theorem was used to calculate post-test probability of death at each interval of lactate using the study’s overall mortality rates as a pre-test probability.

Results: From November 2014 through November 2018, 52,070 patient encounters were returned. The sample consisted of 59.8% females with a mortality rate of 1,060/52,070 (2.04% 95% CI, 1.92%-2.17%). The AUC was statistically significant (p<0.001) 0.734 (95% CI, 0.717-0.751), with the ROC curve showing the best discriminatory value of lactate at 1.85 mmol/L (Sensitivity 67%, Specificity 69%). Interval LR’s were less than 1.0 for lactates between 0.0-2.0 mmol/L, LR=1.4 (2-4 mmol/L), LR=5.2 (4-6), LR=14.1 (6-8), LR=31.5 (8-10) and LR=33.8 (>10). Post-test probability of death with a lactate < 2.0 decreased from 2.04% to 1.07% and increased with higher LR’s to 2.8% (2-4 mmol/L), 9.8% (4-6), 22.6% (6-8), 39.6% (8-10) and 41.3% (>10).

Conclusion: Although the ROC curve analysis showed that a lactate of 1.85 mmol/L was the optimal cutoff, interval lactate analysis showed only a lactate > 4.0 mmol/L significantly impacted post-test probability of death.
Tian Liang  
Advisor(s): Richard Sinert

**The Utility of the Focused Assessment with Sonography in Trauma (FAST) Exam in Pediatric Blunt Abdominal Trauma: A Systematic Review and Meta-Analysis**

Background: Computerized tomography (CT) has become the test of choice for diagnosing intra-abdominal injury (IAI) in pediatric blunt abdominal trauma, but also carries the risk of malignancy from radiation exposure. The Point of Care Ultrasound (POCUS) Focused Assessment with Sonography for Trauma (FAST) is radiation free and may obviate the need for CT in some adult patients. We conducted a systematic review and meta-analysis to evaluate the utility of POCUS FAST in the diagnosis of IAI in pediatric blunt abdominal trauma.

Methods: We searched medical literature from January 1966 to March 2018 in PUBMED, EMBASE, and Web of Science. Prospective studies of POCUS FAST exams in diagnosing IAI in pediatric trauma were included in our final analysis. Sensitivity, specificity, and likelihood ratios (LR) were calculated using a random-effects model. Study quality and bias risk were assessed, and test-treatment threshold estimates were performed.

Results: Eight studies were included encompassing 2,135 patients with a weighted prevalence of IAI of 13.5%. Studies had variable quality with most at risk for partial and differential verification bias. POCUS FAST exams for IAI had a pooled sensitivity of 35%, specificity 96%, LR+ 10.84, and LR- 0.64. A positive POCUS FAST post-test probability for IAI (63%) exceeds the upper limit (57%) of our test-treatment threshold model for CT abdomen with contrast. A negative POCUS FAST post-test probability for IAI (9%) does not cross the lower limit (0.23%) of our test treatment threshold model.

Conclusions: In a hemodynamically stable child presenting with blunt abdominal trauma, a positive POCUS FAST exam means IAI is likely, but a negative POCUS FAST exam alone cannot preclude further diagnostic workup for IAI. The need for a CT scan may be obviated in a subset of low-risk pediatric blunt abdominal trauma patients presenting with a Glasgow Coma Scale of 14-15, normal abdominal exam, and negative POCUS FAST.

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Isaac Gordon  
Advisor(s): Richard Sinert

**The Utility of Ultrasound in Detecting Skull Fractures after Pediatric Blunt Head Trauma: Systematic Review and Meta-Analysis**

Background: Head trauma is a common reason for evaluation in the Emergency Department (ED). The evaluation for traumatic brain injury, involves Computed Tomography, exposing children to ionizing radiation. Skull fractures are associated with intracranial bleed. Point of Care Ultrasounds (POCUS) can diagnose skull fractures.

Objectives: We performed a systematic review / meta-analysis to determine operating characteristics of POCUS skull studies in the diagnosis of fractures in pediatric head trauma patients.

Methods: We searched PubMed, EMBASE, and Web of Science for studies of ED pediatric head trauma patients. Quality Assessment Tool for Diagnostic Accuracy Studies (QUADAS-2) was used to evaluate risk of bias. POCUS skull study operating characteristics were calculated and pooled using Meta-DiSc.

Results: Six studies of 393 patients with a weighted prevalence of skull fractures of 30.84%. Most studies were at low risk for bias. The pooled sensitivity (91%) and specificity (96%) resulted in pooled LR+ (14.4) and LR- (0.14). Using the weighted prevalence of skull fractures across the studies as a pre-test probability (31%), a positive skull ultrasound would increase the probability to 87%, but a negative test would result in the probability of a skull fracture to 7%. To achieve a post-test probability a skull fracture of ~2%, would require a negative skull ultrasound in a patient with only a pre-test probability of ~15%.

Conclusions: A POCUS skull study significantly increases the probability of skull fracture, while a negative study markedly decreases the probability if the pre-test probability is very low.
Utility of Carotid Artery Point-of-Care Ultrasound in Assessing Fluid Responsiveness: A Systematic Review and Meta-analysis

Objective: To evaluate the utility of carotid point-of-care ultrasound (POCUS) to predict fluid responsiveness in volume depleted patients. Design: We conducted a systematic review and meta-analysis searching pubmed, embase, and web of science up to Nov 2018. Patients: We included adult volume depleted patients. Intervention: Carotid POCUS measurements predicting fluid responsiveness. Measurements and Main Results: Five studies were included. Studies measured Carotid Doppler Peak Flow Velocity Variation (ΔCDPV), Carotid Blood Flow variation (ΔCBF), and Corrected Flow Time variation (ΔCFTc). All three measurements (ΔCBF,ΔCDPV,ΔCFTc) were good predictors of fluid responsiveness (LR+ 4.66-15). Conclusions: Carotid point-of-care ultrasound is a promising modality for predicting volume responsiveness in volume depleted patients.

Conservative Treatment of First Carpometacarpal Joint Osteoarthritis Utilizing Adductor Pollicis Myofascial Trigger Point Therapy: A Case Report

We are introducing a new conservative approach to the treatment of first carpometacarpal joint osteoarthritis that can be utilized before the consideration of surgery. We present a 75-year-old right-handed female who presented to an outpatient PM&R practice with right thumb pain of several months’ duration. The patient complained of sharp right basal thumb joint pain especially when working in the kitchen or on forced abduction of the thumb. When doing a “high-five”, she would have sharp pain at the radio-lateral base of the thumb. She denied weakness, paresthesias, or dropping objects. On physical exam, wrist ROM was preserved but. The right web space on thumb abduction was decreased by 50% as compared to the left web space. Right Finkelstein’s sign was negative. There was no tenderness at the base of the lateral thumb, but there was crepitus of the thumb with movement and pain with thumb circumduction. There was right adductor pollicis trigger point tenderness with pain recognition. Over 5.5 months, she was treated with a series of seven dry-needling trigger point treatments to the right adductor pollicis muscle and instruction on a 2-position adductor pollicis stretch. She noted marked improvement in the right thumb pain. She was able to abduct her thumb with improvement in thumb excursion and full movement of the right web space as compared to the left. There was no thumb pain when working in the kitchen or giving “high-fives.” There was still mild pain when fully abducting and extending her thumb but there was no sharp pain. In a follow-up exam 12 months later, there was no longer any thumb pain with activities of daily living and she was able to “high five” without pain or hesitation. Adductor pollicis myofascial treatments with trigger point dry needling and home therapeutic stretching can serve as a cost saving approach to the treatment of non-traumatic thumb pain.
Coping Strategies for Older Women Living with HIV in Brooklyn, NY

Advances in HIV treatment have extended the life expectancy of people living with HIV; however, quality of life for many is compromised by aging-related challenges. We conducted ten individual interviews among women 50 and older living with HIV, who were randomly selected from the Brooklyn Women’s Interagency HIV Study site. Using qualitative and participant observation methods, we explored psychosocial factors associated with successful aging. Each interview lasted 90 minutes and was conducted by a trained qualitative researcher, accompanied by a note taker. Questions asked in the interview explored definitions of successful aging with HIV and obstacles that impede successful aging across various socioeconomic and cultural groups. We analyzed the field notes, audio files and developed matrices to identify recurrent themes and sociodemographic patterns. Two participants in the sample (n=10), self-identified as Latina from Puerto Rico, two as Afro-Caribbean and eight as African American. We found coping and isolation as themes were prevalent; although much of the coping was attributed to life stressors rather than aging with HIV. Seven participants reported some level of isolation. Few isolated themselves entirely from the community, while others engaged in community events, but still felt the impact of isolation when home. A second emergent theme identified, was the use of binge behavior to cope with isolation and stress. Four women reported eating excessive sweets, while one reported excessive drinking. Apart from the woman who binged alcohol, the binge eaters were aware that the behavior was negative. A third theme was the reliance on spirituality. Whether participants attended church or not, nine of the ten women believed that a higher power helps them to cope with life’s adversities. Further research is needed to evaluate the protective or harmful impact of isolation and coping strategies among older women with HIV.

Timely 911 calls for older adult stroke victims: An evidence-based practice proposal

In US, 800,000 strokes occur annually; stroke is 5th leading cause of death & 3rd leading cause of disability. Only 25% of stroke patients arrive in the hospital within recommended 3 hours for optimal treatment. Research demonstrates that immediate calls to 911 can reduce negative outcomes by 24%. Attempts to educate communities about stroke & the need for timely intervention have not been routinely successful because of: poor penetration into ethnic minority groups; education not culturally & ethnically sensitive; costs of mass media; & lack of sustainability. In addition, clinical observations suggest that education that is not personalized does not engage the individual. The proposed educational intervention will build upon content utilized in successful programs. The investigator’s observations suggest the need for a more personalized, meaningful approach to stroke prevention education. Thus, the educational program will include providing participants an opportunity to explore how they might experience negative stroke outcomes. The proposed EBP project will evaluate the impact of an enhanced educational program on knowledge, skills & attitudes about stroke & need for early intervention among older adults. Methods: A pre-post test quasi- experimental design will be used with a convenience sample of older adults in a community center in Brooklyn. The educational intervention is a 1-hour class using power point & videos. Content includes: stroke prevention & treatment emphasizing the need for early intervention & the impact stroke might have on them & their families. Data will be collected immediately before and after the class using an investigator designed survey & analyzed using descriptive & comparative statistics. Research suggests the importance of education to improve stroke outcomes by reducing care delays. If the proposed personalized educational intervention is successful, this approach can be imbedded into community-based stroke educational programs.
Miyaseki Paragas

**A Proposed Study to Evaluate the Short-term Effectiveness of Ketogenic Diet in Reducing HgA1c Levels and Weights in Patients with type 2 Diabetes**

Rationale: Several studies have been done on the effectiveness of ketogenic diet in decreasing the HemoglobinA1c (HgbA1c) in adult patients who have type 2 DM. Evidence suggests that low-carbohydrate ketogenic diets are safe and effective in reducing glycemia in diabetic patients. The purpose of this proposed study is to evaluate the effects of the ketogenic diet in lowering the body mass index (BMI) of 25-30 and HgbA1c of 7.5-9.0 % of patients with type 2 DM over 12-week period.

Methods: Design/Sample: Quasi-experimental, one-group pre-posttest design to investigate the effect of ketogenic diet in reducing HbA1c levels, BMI and diet side effects. Thirty 45-65-year-olds at primary and endocrine care centers, diagnosed with type 2 DM with 25-30 BMI, 7.5-9.0 % HgbA1c, taking only Metformin for DM since diagnosed without evidence of renal insufficiency, liver disease, cancer and cardiovascular disease. Measures: Demographic survey, hypoglycemic episodes assessment, vital signs, body weight, BMI and waist circumference including lab work. Measures assessed at week 0, week 2, 4, 8 and 12 after the ketogenic diet intervention. Intervention: Layman-diet books and handouts distributed to participants, introduce to a diet diary and keeping daily diet reports. A registered dietitian will instruct participants about the specific diet at week 0, reinforced at week 2, 4 and 8. Record of daily morning 30-minute exercise of brisk walking and body stretching.

Data analysis: Chi square test or Fisher's exact test for categorical variables, t-test or ANOVA for continuous variables will be used as appropriate.

Implication: Results may provide important information on the management of type 2 DM and may assist in addressing problems especially in determining optimal medication adjustments. This diet may help assist primary care providers by incorporating diet as one aspect of the Therapeutic Lifestyle Changes recommendation in lowering weight, BMI and hemoglobinA1c.

Agatha Muire

**Building an evidence-based model to integrate ACEs in baccalaureate nursing education: A proposed literature review**

Exposure to adverse childhood experiences (ACEs), which are defined to encompass abuse and household dysfunction, has been shown to have a strong relationship to detrimental health consequences. Adults with two or more ACEs are at increased risk for chronic disease, risk-taking behaviors, unhealthy lifestyles, addiction, social dysfunction, poor educational and economic attainment in adulthood, and early death. Negative health outcomes include top risk factors and diseases, such as smoking, obesity, and drug abuse, and chronic lung disease, cancer, and ischemic heart disease. Exposure to ACEs is common and prevalent across race, gender and income.

As nurses provide patient-centered care it is essential that they are aware of and address ACEs and their sequels in their assessments, interventions and evaluations of care. Nurses need education and training to be able to meet these expectations. However, baccalaureate nursing education does not address the role ACEs play in patient lives. Instead, nursing education surrounding ACEs has been topic specific.

The proposed literature review aims to identify KSAs about ACEs for nurses to effectively integrate prevention and mitigation into their practice. Relative key words and standardized search questions were used. Additional terms resulting from these searches â€“ “trauma-informed care”; “sexual abuse”; and, “childhood adversity and toxic stress â€“ were identified. Despite calls for ACEs education for all health professional students, discussion of the systematic integration of ACEs knowledge remains absent in the literature. As a result, and to build upon the work that has been completed, this project will assess curriculum and conduct an in-depth literature review to identify best practices and develop an evidence-based proposal for a curriculum that will equip graduates with the KSAs they need to prevent and care for patients who have had exposure to ACEs and are living with the long-term consequences of those event(s).
Implicit Biases in the Case of Women with Cardiac Conditions; a Review of the Literature

Implicit bias in healthcare, specifically women’s cardiac care, continues to be an issue in the United States. Heart disease is the leading cause of death in the United States for both men and women, making cardiac conditions a top priority for healthcare providers. By the age of 40, 1 in 3 women will develop heart disease and 1 in 5 will develop heart failure. Between the ages of 65 to 84 years old, the incidence rate of heart failure triples for women. Despite these high incidence rates, when compared to men, women are less likely to be referred for specialty care, receive diagnostic testing, and undergo lifesaving procedures such as revascularization or heart transplant. In addition, women comprise less than 25% of participants in cardiovascular studies. In this literature review, peer reviewed literature published between 2012 and 2018 listed in PubMed and CINNAHL databases was analyzed. The search terms “Implicit bias”, "Heart disease", and "Women" as along with Boolean operators such as “AND” and “OR” were used. One of the major factors that affected the care women received was healthcare provider implicit gender bias. A preliminary review of the literature revealed that providers often displayed gender bias in the diagnosis and treatment of women with cardiovascular diseases. A better understanding of the impact of implicit bias on healthcare treatment, as well as ways to reduce bias in healthcare, will improve the treatment of women with cardiovascular diseases.

Anti-Vaccination Amongst the Hasidic Population: A Review of the Literature

With the introduction of vaccines, beginning with small pox in the 18th century, there has been a significant decrease in childhood mortality & morbidity associated with vaccine preventable diseases & a reduction in the number of outbreaks annually. In Hasidic communities, rabbis & local doctors encourage vaccines, yet there are still those that do not vaccinate their children. Although it is most Yeshivas’ policy to not admit non-vaccinated children, “anti-vaccination” parents are pushing the Yeshivas to admit their children. They argue that the Yeshivas are denying their children a Jewish education and argue for religious exemption. The underlying distrust of vaccines of these individuals are unknown. The main concern is that the rise of “anti-vaccinators” & the pressure on Yeshivas will allow the viruses to become immune to the vaccine & affect vaccinated children, eventually growing out of the Hasidic community. It is imperative to determine the rationale behind anti-vaccination sentiment in order to implement solutions. An anti-vaccination movement has found a home in the Hasidic & orthodox communities of New Jersey & New York. Its effects are being seen in the current outbreak of measles in Rockland County, Brooklyn & in Ocean County, New Jersey. This review looks at Hasidic communities at large as opposed to individual communities. Literature on why some Hasidim are not vaccinating is sparse. The aim of this review is to gain a better understanding of the underlying reasons for low vaccination rates among Hasidic Jews. It will then be possible to identify, implement & evaluate strategies to enhance vaccination rates in this community. After a comprehensive literature review about vaccine hesitancy, additional research or an evidence-based practice project will be proposed.
Food Insecurity among Older Adults: Developing a Sensitive, Practical Screening Tool

Food insecurity, defined as experiencing food shortages, disturbed eating, and reduced food intake, affects an estimated 50 million Americans. One in eleven seniors experiences food insecurity, representing the fastest growing population impacted by this issue. As research unequivocally correlates food insecurity with negative health outcomes, healthcare providers must be able to identify those affected and establish a point of intervention. SUNY Downstate, led by the College of Nursing, is collaborating with the New York State Department of Agriculture and Markets to develop and implement a screening tool to evaluate food insecurity among older adults, refer those identified to nutritional consultation and education, provide workshops and education about food resources and nutrition, and distribute food and food preparation items. The goals of this project are to partner with primary care practices and community organizations to increase food insecurity screening of and referrals for older adults, improve access to education and resources, and reduce health risks related to food insecurity among seniors. Providers and the community need practical, sensitive, implementable food insecurity assessment tools to achieve these goals and thus, the first step is to develop and test such a tool. A literature review and comparative analysis of screening methods revealed that a two-question tool, used in Vermont, Wisconsin, and the Indian Health Service, had both high sensitivity and specificity in the study populations. The SUNY Downstate project will develop and test a tool for central Brooklyn, a population that is 80% black, with 31% living below the poverty line and 29% without a primary care doctor. Such patient characteristics are underrepresented in the literature, an issue that must be addressed, as screening is the first step to meeting project goals and reducing food insecurity and its associated negative health outcomes among older adults in the community.

Non-pharmacological interventions for the treatment of behavioral and psychological symptoms of dementia: A review of the literature

Most patients diagnosed with dementia experience behavioral and psychiatric symptoms (BPSD) including agitation, delusions, paranoia, wandering, apathy, and sleep disturbances. These BPSDs are often associated with poor patient and caregiver outcomes. Antipsychotics are utilized to treat these symptoms however antipsychotics may have adverse effects when used in patients with dementia. In addition, these medications may lack significant efficacy. Despite their risk and lack of efficacy, the use of antipsychotics for the treatment of BPSD remains prevalent. The aim of this work is to review the non-pharmacological interventions that have been tested in controlled studies.

A comprehensive review of the literature published between 2010 and 2018 was conducted. Search terms included “non-pharmacological”, “interventions” “behavioral and psychological symptoms”, “BPSD”, and “dementia”. Three databases were searched including CINAHL, Pubmed, and EMBASE. Studies published in languages other than English were excluded. Lateral search strategies were also employed. These included using reference lists from relevant papers returned in the database search and the ‘cited by’and ‘similar articles’features on PubMed.

Preliminary review of the literature suggests that non-pharmacological interventions are a potentially efficacious alternative to pharmacological treatments for BPSDs. We identified 12 papers which utilized various non-pharmacological interventions in controlled trials. Multiple studies looked at exercise, aroma therapy, and music therapy. There’s potential for more research in other areas such as art therapy, doll therapy, ECT, massage therapy, meaningful activity, pet therapy, reminiscence.

A better understanding of problems associated with BPSDs and their treatment will provide a base for determining the efficacy of non-pharmacological treatment options which could improve patient/caregiver outcomes. A significant number of people living with dementia have comorbid conditions, which further complicate treatment and care.
Direct Observation of Patient Education by the Healthcare Team on the Day of Discharge

Background: The transition of care from hospital to home is a vulnerable time for patients. Though suboptimal discharge education can lead to post-hospitalization morbidity and readmissions, implementation of recommended high-value discharge practices remains scare. Bedside observations are critical to inform gaps in care delivery. This study is the first to capture the discharge process by the entire healthcare team from the patient perspective.

Methods: Patients designated for “discharge by noon” at a tertiary care teaching hospital were selected with purposeful sampling. A researcher sat with a single consented patient from 6:00am until discharge and recorded all discharge communication. Field notes were analyzed for education on key domains: medications, appointments, illness self-management, symptom expectations, red flags, teach-back and patient activation.

Results: To date, 22 field notes with 110 observation hours have been conducted. On average, interns spent less than 2 minutes on discharge education and attendings just over 2 minutes. Nurse discharge practices varied. While most patients were told about medication changes, the majority were not told their purpose. Most patients were not told the purpose of appointments. There was minimal education on disease self-management, symptom expectations or red flags. Education was one-sided - use of the teach-back method was only observed once. Only four patients was asked about potential barriers. The majority of communication on the day of discharge concerned the logistics of leaving the hospital.

Conclusions: There is significant opportunity for improved discharge techniques to enhance patient activation after hospitalization. Interventions must be implemented to increase patient education and clarify interprofessional roles. Further studies on systems redesign that foster patient-centered discharge education are imperative.

Overcoming barriers to nursing-initiated ambulation: A review of the literature

Barriers to nurse-initiated ambulation includes lack of time because of large workload, hospital policies that overemphasize “no fall" campaigns, lack of knowledge about the significant improvement in patient outcome due to frequent ambulation and lack of proper training on how to safely ambulate patients. As the population grows older and continues to live at higher ages, the incidence rate of loss of independent ambulation can also increase in the healthcare field. This could increase demands on health care resources. Nurses will play a pivotal role in ensuring that these patients are ambulated. Results have shown that those nurses who take responsibility for ambulating their patients are also those that collaborate with physical therapy to promote progression of patient mobility, communicate with physicians to ensure the adequate movement of patients, and actively engage in ambulation assistance with patients. Those that do not claim responsibility for ambulation are more likely to wait and delay ambulation based off the actions of other professionals like physical therapists and doctors. These nurses typically do not engage patients in ambulation unless directed. Lack of ambulation usually results in more negative outcomes such as functional decline, prolonged periods of hospital stay, and higher incidence of readmission. A more comprehensive literature review will be conducted to identify the scope of the problem and the obstacles and barriers contributing to it. In addition, best practices will be identified and used to develop an evidence-based practice project that can be implemented and tested.
Jian Wang  
Advisor(s): Shirley Girouard

**Does preoperative cranial hair removal reduce the incidence of infections? A review of the literature**

Body hair has been considered a potential risk factor for acquiring surgical site infections (SSIs) following an operation. It is of particular concern in neurosurgery involving cranial incisions. The objective of this literature review is to understand the significance of scalp hair in relation to surgical site infections. This will allow us to compare the incidence of SSIs in cranial surgeries completed with and without scalp hair removal to identify the best practice for preoperative preparation of the scalp. Peer-reviewed journals from the American Association of Neuroscience Nurses, British Journal of Neurosurgery, American Academy of Otolaryngology-Head and Neck Surgery Foundation, Journal of Cranio-Maxillofacial Surgery, WHO, and Acta Neurochirurgica, were searched from databases "Google Scholar", “Clinical Key,” and “PubMed.” Search words used for this study include “hair”, “neurosurgery”, “hair removal”, “craniotomy”, and “surgical site infections” from 2001 to 2016. Both randomized clinical trials and systematic literature reviews were selected which pertain to the question of whether or not preoperative hair removal for cranial surgeries contributes to SSIs. The studies reviewed suggest that there is no significant difference in the rate of postoperative surgical site infections in patients who have or have not had hair removal prior to surgery. Therefore, it is recommended that hair be left alone during pre-procedure care. While hair removal at the site of surgery may be beneficial in visualizing the incision line or removing potential microorganisms that are on the hair, avoiding this preoperative preparation can boost patient confidence and make the transition after surgery easier for patients.

Tisha Thomas  
Advisor(s): Shirley Girouard

**Impact of Parental Culture on the Care of Children with Special Healthcare Needs: A Review of the Literature**

The purpose of this project is to bring awareness to and to understand how parental culture can affect the access to resources for children with special needs, as well as to highlight the disparities that may arise from it. Parents are often their child's first advocate and this is even truer for parents whose children have special needs. However, being an ethnic minority and an immigrant poses its own challenges and obstacles. Being an ethnic minority and an immigrant often times means having to navigate a whole new world along with having to advocate for their child. Also, often times cultural perceptions can skew the way in which a person views people with special needs. This can deter the families affected from seeking the care that is imperative for optimal quality of life for their child. These combined factors, can have a detrimental effect on the child. Children with special needs who do not have access to, or receive necessary resources will unfortunately later become adults with special healthcare needs that are unable to have optimal quality of life A preliminary review of the literature was done. A preliminary literature review showed racial disparities in access to resources. In addition, the research suggests additional problems for racial and ethnic minority youth transitioning from pediatric to adult care. Hispanic and non-Hispanic Black children with special needs have a 1.6 the odds of not receiving adequate healthcare. Continuity of care is a factor that can determine the overall quality of life especially someone with special needs. Nurses are at the “frontlines” of care, so need to be aware of these disparities so they can be attentive to the needs of children with special health care needs who are also racial and ethnic minorities. This literature review will be shared with student and practicing nurses who care for children with special healthcare needs.
**Social Media, Smartphones and Anxiety**

The relationship between intensive use of social media and smartphones has been well established, however, more research is needed to understand how social media and smartphones can positively and negatively affect certain age groups of the population. It has been proposed that anxiety may be linked to the excessive use of smartphones and social media. To date, several studies have focused on adolescents as an age group with specific vulnerabilities to the outcomes of social media and smartphone use and overuse. The aim of this study is to determine if increased use of smartphones and social media is related to the development and increase of anxiety in young adults who are attending a baccalaureate nursing program. This study will use a quantitative, descriptive, cross-sectional design to investigate the relationship between reported screen and smartphone time and anxiety in young adults. A total of 50 baccalaureate nursing students between the ages of 23-40 will be included in the study. Using the Smartphone Technology Use Questionnaire, participants will report intensity and frequency of social media and smartphone use. Additionally, they will be asked to rate their level of anxiety using the Beck Anxiety Inventory. The data will be analyzed using Pearson’s correlation coefficient to determine if there is an association between intensity and frequency of smartphone and social media use and anxiety. The data on this topic is limited and more research must be conducted to establish a relationship. Smartphones and social media have become central to the lives of young adults, and therefore, it is essential to explore how they influence the development and increase of anxiety in this age group. This will allow clinicians to develop appropriate recommendations and treatments for young adults in an intensive degree program who struggle with anxiety related to smartphone and social media use.

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**Perceived Barriers to Obesity Management Among Primary Care Providers in Brooklyn, NY**

Approximately 35% of adults in the United States have a Body Mass Index (BMI) in the obese range. Costs related to obesity is significant in terms of medical expenses, disability, and death. The average annual national medical cost related to obesity is $149.4 billion (Andreyeva, Luedicke & Wang, 2014). The American Medical Association has classified obesity as a chronic disease and set guidelines for obesity management in primary care settings. However, primary care providers (PCP’s) are not consistently initiating treatment to manage obesity. PCP’s treat several chronic diseases that have adverse outcomes when combined with obesity. Reasons for this inconsistency in treatment needs further investigation. The purpose of this study is to identify existing barriers that prevent primary care providers from initiating treatment and managing obesity. Previous studies have attempted to identify causes for the lack of obesity treatment in primary care, but to date, none have specifically addressed the issue in Brooklyn, New York or identified how culture and socioeconomics influence providers’ perceptions of barriers to obesity management. Providers’ perceptions of barriers will be identified using a prospective cross-sectional quantitative study. Five outpatient clinics in Brooklyn, NY will serve as the setting from which 50 primary care providers (physicians and nurse practitioners) will be recruited. Data will be collected through anonymous electronic surveys. Demographic information collected will include providers’ age, terminal degree, years of experience. Descriptive statistics will be used to report demographic and questionnaire results. Implications of the study may be important in helping providers identify how they can recognize and overcome issues related to obesity management. It is anticipated that providers will be able to help patients adhere to obesity management and implement novel approaches to managing the needs of their obese patients.
Discrimination, Resilience, and HIV Medication Adherence.

Introduction: Stigma and discrimination are associated with reduced medication adherence and HIV viral control, as well as reduced access and quality of care for HIV. One approach to this issue is to identify pathways to resilience, to minimize the impact of discrimination. We analyzed data from the Women’s Interagency HIV Study, a longitudinal cohort study of HIV infection, to assess whether positive affect, a documented source of psychological resilience, buffers the impact of discrimination on HIV medication adherence.

Methods: Women living with HIV completed a measure of perceived discrimination at a single study visit between 10/1/13 to 3/31/15. Self-reported adherence of 95% or greater was assessed at the six-month study visit subsequent to the discrimination assessment. Multiple logistic regression was used to analyze the relationship between discrimination and adherence, controlling for age, negative affect, recent substance use, and positive affect. An interaction term between discrimination and positive affect was added to the model to examine the buffering hypothesis.

Results: Among 1,710 women, 38.1% reported lifetime discrimination, and 10.4% reported discrimination within the past year. Those that did not experience recent discrimination were more likely to be adherent compared to those who did not experience discrimination (84.4% vs. 73.7%, p=0.001). In the covariate adjusted model, better adherence was associated with higher positive affect, lower negative affect, older age, and no substance use. The adjusted association with recent discrimination was not significant (p=0.06), nor was the interaction of positive affect and recent discrimination (p=0.80).

Conclusions: Positive affect is shown to be associated with better medication adherence; however, it does not appear to influence the relationship between discrimination and adherence.

Development of a Community Survey to Address Planetary Health and Neighborhood Quality of Life

The SUNY Downstate student-led Planetary Health Club, housed in the School of Public Health, was formed in 2017 in response to the Lancet Commission Report on Planetary Health (2015). Club members developed a community environmental quality survey to address planetary and public health issues in the community. Planetary health refers to “the interconnections between the health of person and place at all scales.” Human health and wellbeing is impacted by the changes that have been occurring to our natural systems as a result of human behavior, also termed anthropogenic threats. Understanding planetary health can help in preventing health issues, risk reduction, and health promotion. Wellness of both individuals and communities are dependent on the environment, and to achieve high-level wellness, the environmental and planetary health must be taken into consideration.

Our 45-item survey addresses demographics, indoor environment, neighborhood or outdoor environment, climate change preparedness, and global environment, and will be collected by zip code. Questions were developed from previous neighborhood environmental quality surveys, as well as items representing planetary health priorities. The survey consists of varying questions types, including Likert scale, and are meant to help understand attitudes and perceptions about planetary health issues that exist in the community. The survey will be pilot tested for content validity and comprehension in a small subset of the target population and administered through Qualtrics as well as in paper form for those who do not have online access. The data will be used to inform local policy on climate change preparedness and environmental quality in our communities.
Various Ejection Fraction Measurements Utilizing Echocardiography Simulation in an Educational Setting

Background & Purpose: The purpose of this study is to identify ejection fraction (EF) measurement methods that are more reliable and have less variability compared to those that require a higher degree of experience to accurately measure. EF is a measurement used to assess systolic function of the heart. EF is the percentage of blood leaving the heart. Different methods to measure EF using echocardiography are 2D, m-mode, Simpsons, & visual estimation. Echocardiography uses ultrasound to image the heart and its structures. Sonographers are trained to perform echocardiograms and acquire these measurements. However, accurately measuring EF via echocardiography is difficult for sonography students to master. To proficiently obtain EF measurements, proper training and experience is required; the learning curve is improved by practice in an educational setting. HeartWorks is a cardiac simulator where educational experience can be acquired. HeartWorks encompasses realistic views of the heart in addition to fifteen simulated pathologies to train novice sonographers. HeartWorks gained wide acceptance in training programs, exposing learners to a variety of scenarios to help build their confidence to acquire EF measurements on a live patient.

Methods: In this study, we focused on assessing left ventricular EF using different methods by three novice student sonographers and one experienced sonographer. Results: A one-way ANOVA showed significant difference between groups utilizing different methods to measure EF (p = .036). Further analysis using a paired t-test demonstrated significant difference between left ventricular end-diastolic and end-systolic measurements via the 2D method (p = 0.0221).

Conclusion: Students frequently underestimate cardiac measurements. A cardiac simulator is a useful tool to identify systematic errors in students’ measurements. These errors can be used to challenge, educate and train students how to perform proper cardiac measurements.

The Effects of Caffeine on Cerebral Circulation: A Transcranial Ultrasound Study

Abstract: Background: Caffeine is consumed by many students in large amounts because of its neurostimulating effects. It has been concluded in past research that caffeine is a vasoconstrictor and decreases cerebral blood flow. However, there has been little research on the impact of caffeine on cerebral blood flow in healthy young adults.

Objective: The aim of the study was to assess the effect of caffeine on cerebral blood flow in a healthy young adult population after caffeine consumption.

Methods: The study employed transcranial Doppler ultrasound to evaluate the middle cerebral artery of 30 SUNY Downstate students, age 20-35 (15 low caffeine consumers and 15 high caffeine consumers). Participants consumed caffeinated coffee on one day and decaffeinated coffee on another day. Baseline peak systolic velocity, end diastolic velocity, mean flow velocity, pulsatility index, resistive index of the middle cerebral artery, blood pressure and heart rate were measured. Measurements were repeated after intervention in 15-minute intervals for one hour.

Results: Measurements at 15-minute intervals were compared to baseline measurements and low caffeine consumers were compared to high caffeine consumers.

Conclusion: The data has been collected from 11 low-caffeine consumers. Researchers expect that additional participants will join and contribute sufficient, meaningful results to test out the original research question.
Sonographers’ Scope of Practice: A Phenomenological Approach

The field of sonography is always changing with new innovations and emerging specialties. With all these changes, the workload for sonographers is increasing and with that so are their roles and responsibilities. There is a lack of research and reporting done on sonographers’ roles in the United States.

While the American Institute of Ultrasound in Medicine (AIUM) and Society of Diagnostic Medical Sonography (SDMS) have come out with general guidelines for sonographers, these do not encompass all that is expected of a sonographer. They do not address sonographers’ ongoing communication with the patient regarding results and aspects of their work environment.

The purpose of our research was to identify and distinguish similarities and differences amongst the participants and further define the role of a sonographer. The study used a phenomenological approach, interviews and observation, to determine a sonographer’s daily scope of practice.

When interviewed, 60% of participants answered that complete and thorough examinations were the most important part of their job. The other 40% thought that patient care was the most important. When participants were asked, “What skills does a sonographer need to have?”, 13 out of the 15 answers revolved around emotional intelligence. Stressing the importance of communication, empathy, and being a people person.

Future studies could collect the official job descriptions from sonographers and review with them all that their role encompasses or what they feel is lacking from the description. This study only had one male participant. Future studies could look at the demographics of the profession. They could answer the question of if this is a female dominated profession. This study is a start for future studies on the sonography profession.

References

The Use of Ultrasound for Detecting Median Nerve Size Differences in Asymptomatic Adult Musicians vs Non-Musicians

Carpal tunnel syndrome (CTS) is the most common nerve entrapment neuropathy affecting the upper limb occurring in 2.7% of the general population. The carpal tunnel is a narrow passageway bound by carpal bones and ligaments that run down the forearm to the base of the palmar wrist. CTS occurs when the median nerve is compressed in the carpal tunnel. Symptoms present as pain, numbness, or tingling in the hands and wrist. CTS afflict professionals employed in vocations that involve repetitive hand motions and vibrations. It is prevalent in people who suffer from wrist trauma, causing swelling of the median nerve. Instrumental musicians can develop CTS from repetitive gripping, delicate hand movements, vibrations from the instrument, and poor posture. Severe CTS can deteriorate the quality of life of musicians because it affects their livelihood.

Diagnostic tools such as ultrasound can be used to detect signs of CTS. Ultrasound is an efficient, cost effective, dynamic, noninvasive test, less painful alternative to the gold standard of an electrodiagnostic test. Measuring the cross-sectional area (CSA) of the median nerve with sonography, at the inlet and outlet of the carpal tunnel appears to have a high sensitivity and specificity for detecting CTS. 33 participants were recruited to participate in this single blind study. Wrist measurements, gender, age, hand dominance, primary instrument, and inlet and outlet CSA measurements were recorded and analyzed. Results of sonographic findings determine the need to promote early ultrasound screenings in asymptomatic musicians urging clinicians to take preventative measures to mitigate CTS development. The intent of this research study was to determine whether there is a significant difference in median nerve size between asymptomatic musicians and non-musicians using ultrasound.
Yamelia Rodriguez  Advisor(s): Rivka Hellmann

**Pump Up the Volume: Assessing Inter-rater Reliability When Measuring Sonographic Liver Volume by Novice Sonographers**

The liver is a vital organ responsible for over 500 functions including toxin metabolism, protein production, digestion, and immunity. Liver size is important to evaluate as an enlarged liver has been shown to be present in states of pathology such as hepatitis. Ultrasound is a commonly used imaging modality to assess internal organs and is preferred in some instances over other modalities such as CT. Aim: Current standards in most health care facilities for assessing liver size in ultrasound is to use a single linear measurement, whereas a volumetric measurement (typically performed in CT and considered the gold standard) has been demonstrated to more accurately depict true liver size. Furthermore, the single linear measurement obtained for the liver in ultrasound can vary from lab to lab. This research aims to assess how easily achievable, consistent, and timely is obtaining liver volume measurements on an abdominal ultrasound for the novice student sonographer. Materials and Methods: With a sample size of 15 participants in a blinded study, liver volume was obtained on ultrasound by taking three linear liver measurements and calculating the volume. Time for acquisition and measurements (linear and volumetric) were compared between three novice student sonographers. Results: Modest variability was demonstrated between the three novice student sonographers. The average time for a single linear measurement was 47.14 seconds, while average time for liver volume was 111.32 seconds, with 64.18 seconds taken on average to obtain two more linear measurements to calculate liver volume. Plotted graphs between three novice student sonographer show consistency in both simple linear and liver volume measurements. Conclusion: This limited study has proven that novice student sonographers are able to consistently measure liver volume with limited training. With more experience, liver volume can be obtained more consistently in terms of timing between sonographers.

Rebecca Larian  Advisor(s): Daniella Yeganeh

**The measurement of strain of sonographers’ muscle using an ergometer**

Knowledge about taking proper ergonomic precautions are necessary to reduce work related musculoskeletal disorders. For sonographers, this encompasses evaluating work practices and positions throughout the scan to determine methods to reduce the risk of injury amongst sonographers in different ultrasound modalities. An ultrasound machine, electrodes and a pocket ergometer were used in the study to determine the most optimal position for different ultrasound modalities. The Pocket Ergometer measured the amount of strain placed on the trapezius muscle, its surface electromyographic sensors provided audible tones as biofeedback to the individual who is attached to the electrodes by the ultrasound machine. Three healthy female sonography students (mean age 22 years old) participated in this study performing different positions of four different ultrasound modalities including carotid, echocardiography, lower extremity venous, and abdominal ultrasound protocols. Data were analyzed to identify positions that may have caused higher or lower strain. The study findings indicated that during a lower extremity vascular exam it is optimal for the sonographer to scan on the patients’ right side with the machine adjacent to the patient (t-test p= 0.04). We also found that during a carotid exam it is optimal for the sonographer to scan above the patients’ head (one way ANOVA p= 0.022, above the head is better than standing p=0.031). The positions compared for an abdominal examination and echocardiography did not show differences with the three subjects. This project identified positions associated with lower strain that may be useful for increasing sonographer comfort and long-term occupational health.
Outcomes of Long Term Follow Up In Patients with Iron Deficiency Anemia And Initial Negative Upper Endoscopy, Colonoscopy And Video Capsule Endoscopy

Methods: Medical records at the VA NY Harbor were queried for patients who have IDA and underwent EGD, colonoscopy, and VCE between 2005-2015. Anemia was defined as hemoglobin less than 13g/dL in men and less than 12g/dL in women. Exclusion criteria were pre-menopausal women, IBD, CKD, CHF, and history of GI cancer. Baseline studies including hemoglobin, ferritin and iron levels were recorded prior to initial endoscopic and VCE studies and were subsequently followed at 1, 3, and 6 year intervals.

Results: A total of 7,000 records were reviewed; 311 patients had EGD, colonoscopy and VCE; 67 of these patients did not meet inclusion criteria. Of the remaining 244 patients, 86 patients had a negative workup and were included in analysis. The mean age was 69.99 (± 11.1). IDA resolved in 24 patients, 41 patients had persistent anemia, and 21 patients had recurrent anemia. Of the 86 patients with negative initial workup, 66 (76.7%) patients went on to have subsequent bidirectional endoscopy or VCE. 47 (71.2%) patients had subsequent EGD with 11 (23.4%) patients having positive findings such as gastric ulcers. 50 (75.7%) patients had subsequent colonoscopies, 13 (26%) of these patients had findings to explain their IDA such as bleeding hemorrhoids. 14 (21.2%) patients had subsequent VCEs, and 4 (33.3%) of these patients had findings to explain their IDA such as AVMs.

Conclusions: Our findings are consistent with previous reports indicating that elderly patients who have an initial negative workup for IDA tend to have favorable outcomes. 21.2-33.3% of our patients had some findings on subsequent workup to explain IDA, however those findings were benign. In addition to previous published data, our study also highlights the significance of VCE as a tool for identifying a bleeding source.

Practicality of Optical Coherence Tomography to Accelerate Treatment of Basal Cell Carcinomas

Purpose: The gold standard of basal cell carcinoma (BCC) diagnosis is a skin biopsy. Given the steps involved in preparing and reading biopsies, BCC treatment involves multiple visits to the dermatologist. Incorporating optical coherence tomography (OCT) into a clinic setting can expedite the diagnosis, treatment, and clearance of BCCs into a single clinic visit.

Design: On a routine full-body skin exam of a 71-year old Caucasian, four pink scaly papules on the torso were concerning for BCCs under dermoscopy. He wished to have all of the lesions treated in one visit without delay. All 4 lesions were photographed, triangulated, and imaged with OCT (Vivosight, Michelson Diagnostics, Kent, UK). The OCT images were used for both diagnosis and margination. A thin shave of the 4 lesions was sent to pathology for confirmation. Then each site was treated with curetting once for treatment followed by a small application of 35% trichloroacetic acid for hemostasis. OCT was repeated to view the margins of each lesion. No evidence of residual BCC was present at the lateral margins. Next, a second thin shave was performed on all 4 treated sites and sent to confirm clearance.

Three days later, the 4 pretreated shave specimens were all diagnosed as superficial BCCs (sBCC), and all 4 post-treated sites were clear of BCC and had clear margins. The patient returned at one-month and all the sites were healed appropriately with very minimal scarring. At one year follow-up, there was no evidence of recurrence at any site.

Conclusion: We present a case where cutaneous imaging was used in vivo to identify BCCs. On the day that he came for a full-body skin exam, our patient was able to have 4 different sBCCs diagnosed, treated, and have confirmation of clearance all in one visit. Cutaneous imaging and OCT has been used in dermatology for over 10 years now, yet it is still used sparingly. Its utility is valuable and can expedite the identification of BCCs as well as other skin cancers.