2017 RESEARCH FORUM ABSTRACTS

TUESDAY, APRIL 18, 2017
OU-TULSA FOUNDERS HALL

Held in Conjunction with the University of Tulsa Student Research Colloquium
THE EPIDEMIOLOGY OF MAXilloFACIAL FRACTURES IN OKLAHOMA

Objective: Maxillofacial fractures remains a significant cause of morbidity in trauma patients. Multi-specialty surgical attention is required to provide this cohort of patients with the best outcome. Little is known about the landscape of these fractures in rural America. The purpose of this study was to investigate the epidemiology of such traumas in Oklahoma; a predominantly American rural state.

Methods: Data from the Oklahoma State Trauma Registry (OSTR) from 2005 through 2014 were analyzed. As of January 2015, there were only one Level I and 2 Level II trauma centers in the entire state of Oklahoma. We identified 8867 adult patients (Age 18 and older) with nasal, malar/maxillary, mandibular, orbital floor, and other facial fractures. Variables of interest were age, gender, race, mortality, and mechanism of injury. Data was analyzed using Statistical Package for Social Sciences (SPSS) software.

Results: Analysis revealed that the most common mechanism of injury was assault (n=2565) followed by motor vehicle accidents (n=2343) and falls (n=1621). However, falls were the most common cause of maxillofacial fractures in older patients (mean age=63.8, p<0.05). Male patients were significantly more than female patients (n=6727 and 2127, respectively, p<0.05). Maxillofacial injuries were more common in patient from white race (76.1%) than black (9.2%), native American (7.6%), and other races (7.2%) (p<0.05). There was no association between mortality and a specific kind of maxillofacial fracture when compared to rest of the population.

Conclusion: The demographics of patients suffering from maxillofacial injuries is comparable to studies that looked at urban communities. Fall remains the most common cause of facial fractures in the older population, while assault, motor vehicle collision, and motor cycle collision are the most common in younger population. This study helps determine the management needs, need for transfer, and risks of mortality associated with facial fracture in the setting where only one level 1 and two level 2 trauma centers.

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A CONNECTOMIC ATLAS OF THE HUMAN CEREBRUM

Background: As our knowledge of the brain increases, more clinicians acknowledge that the cerebrum is composed of complex networks that interact synchronously in order to execute functions. While surgeons can typically predict and preserve primary cortical locations such as the primary visual and motor cortices, preservation of higher cognitive functions that are less localized in regions previously deemed “silent” has proven more difficult. This suggests that progress in cerebral surgery will only be achieved with a better understanding of cerebral anatomy and its elaborate networks. The Human Connectome Project recently parcellated the brain into 180 distinct regions. This has provided a superior framework and nomenclature for studying cerebral function and anatomy, as the entire brain has not been parcellated since
Broadman’s work in 1909. This study illustrates the location of the 180 parcellations on cadaveric brains and provides detailed maps of the structural and functional connectivity of each area, when appropriate we provide the significance of the observations that arise from our analysis.

**Methods:** The software Workbench, from the Human Connectome Project assisted in defining the 180 anatomic regions. The regions were translated from a computerized brain to that of a cadaveric brain. Functional connectivity was analyzed with Workbench from resting state functional MRIs. Structural connectivity is shown with white matter tract anatomy produced in DSI studio using regions of interest of parcellations defined in Workbench.

**Results:** Anatomic parcellations do not always correlate with gyri and sulci patterns of the cerebrum, many gyri contain numerous parcellations that overlap with adjacent gyri, or are only contained in sulci. Distinct brain parcellations, such as those of the parietal lobe show high functional connectivity with nearby and distant parcellations. The structural connectivity of the 180 regions is currently being processed to complete the atlas and make overall observations about cerebrum connectomics.

**Conclusion:** We present this information in hope that the complexity of the cerebral connections will be presented in a more manageable format that will allow clinicians and neuroscientists to accurately communicate and formulate hypotheses regarding cerebral anatomy and connectivity. We believe access to this information may provide the foundation for improving surgical outcomes by preserving lesser-known networks responsible for higher functioning.

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A QUALITY IMPROVEMENT PROJECT TO DECREASE NO-SHOW RATE IN AN URBAN ACADEMIC ASSOCIATED RESIDENCY OUTPATIENT CLINIC

**Introduction** No-show in outpatient clinics is defined as patients who fail to attend their scheduled appointments or who cancel on the day of appointment. It is a major problem in meeting various clinic targets including number of patients seen per clinic session by resident physicians. Studies have shown that reaching out to patients with improved communication can help reduce no-show rates. The purpose of this study was to see if direct patient communication reduced the clinic noshow rate.

**Methods** The study was undertaken as a quality improvement project in an urban, academic-associated residency outpatient clinic. A Plan-Do-Study-Act (PDSA) cycle was conducted to test if resident or patient service representative (PSR) calls led to an increased number of scheduled patient visits and fewer no-shows. Over two consecutive evenings, 3 residents and 3 PSRs called patients who had not been seen in the clinic during the last 6 months. Data was collected on all calls noting if 1) the patient scheduled or declined to schedule and the reason, 2) a message was left for the patient, 3) it was a wrong number, or 4) there were other reasons not to schedule, and then used to compare results for calls made by residents and PSRs. Success was defined as an appointment scheduled and kept by the patient.

**Results** Two hundred eighty (280) calls were made (145 by residents, 135 by PSRs). Overall, 49 (17.5%) of the patients contacted made appointments (17 for residents, 32 for PSRs). Of those scheduled, the show rate was 76.5% and 65.6% for residents and PSRs, respectively. The overall no-show rate was 30.6%. Almost 50% of the calls resulted in a left message or were placed to a wrong number.
Discussion There was a higher show rate for patients called by the residents, possibly because the patients felt a sense of importance when called by their physician and thus were more likely to keep their appointment. However, there was a greater rate of scheduling with PSR calls. Unfortunately the personal calls did not result in a lower no-show rate than the 24% seen clinic-wide for the month in which the calls were made. More work needs to be done to determine the reasons for such a high no-show rate, but speculation falls on the demographics of the patient population that is under-insured, lacks personal transportation, and maintains an unreliable mode of communication.

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UTILITY OF A RESIDENT-LED PRENATAL CHART REVIEW: A QUALITY IMPROVEMENT PROJECT TO ENHANCE TDAP VACCINATION AND ANEMIA RESCREENING RATES

Introduction
Prenatal care is an integral part of a family medicine (FM) resident’s curriculum and training experiences. As such, it is vital that FM residents acquire this core competency and understanding based on current standards of practice in order to provide the highest quality of care for the mother and fetus. Chart review audits have been shown to be an invaluable tool to ensure consistent standards of care are being followed for every prenatal patient. The goal of this study was to evaluate whether the use of the resident-led prenatal chart review enhanced the rates of Tdap vaccination during the pregnancy course and rates of re-screening for anemia in the second or third trimester of pregnancy.

Methods
This quality improvement project was conducted in an academic primary care clinic. Through the employment of a resident-led chart review, the project developed and implemented an evidence-based scorecard to assess its utility for monitoring two important prenatal care measures: Tdap vaccination and completion of second or third trimester anemia rescreening. The chart review process was initiated in January 2016. Rates of Tdap and anemia rescreening were measured in pregnant patients from January 2016-February 2017 and compared to preintervention data collected for January-December 2015. Exclusion criteria included fewer than 5 prenatal visits, no visits within the 24-32 week gestation period, and no prenatal care before third trimester of pregnancy.

Results
A total of 215 charts (109 for pre-intervention, 106 for post-intervention) for prenatal patients seen in the clinic were consecutively chosen and reviewed. The Tdap vaccination rate before resident-led chart review implementation was 24.8% (27/109) compared to 82.1% (87/106) thereafter. The pre- and post-intervention anemia rescreening rate was 45.9% (50/109) and 58.5% (62/106), respectively.

Discussion
Improved rates were observed for both Tdap vaccinations and anemia rescreening with implementation of the resident-led chart review. The chart review process not only brought increased awareness among residents of gaps and deficiencies in care, but served as an important means to help standardize provision of prenatal care across resident practice. Several concerns have been identified and include maintaining a sustainable resident-driven process,
continually educating and training current and new health care professionals on evidence-based prenatal care protocols, and increasing communication and consistency of care among providers. A survey of resident satisfaction and self-efficacy on prenatal care is currently in progress to evaluate the prenatal chart review process.

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FALLS AS THE LEADING CAUSE OF TRAUMA IN OKLAHOMA: EPIDEMIOLOGY AND OUTCOMES

Objectives: As demographics in the United States shift, falls have become one of the major causes of traumatic injury. More than 27,000 adults died secondary to falls in 2014 with a total cost of more than $30 Billion. As this epidemic continues, it is becoming more important to understand the epidemiology and risk factors for falls in order to reduce these numbers. Our study looks at the number of falls in the state of Oklahoma from 2005 to 2014.

Methods: Patient characteristics, mechanisms of injury, and outcomes of trauma were analyzed from the Oklahoma Trauma Registry data from 2005-2014, excluding 379 patients (0.3%) without recorded etiologies. The study population consisted of patients with a trauma diagnosis (ICD-9 800.00-959.9) and with major severity (Abbreviated Injury Scale severity value ≥ 3, Injury Severity Score ≥ 9, TRISS or Burn Survival Probability < 0.90, or death). One of the following was also required: 1) length of hospital stay ≥ 48 hours; 2) dead on arrival or death in the hospital, 3) hospital transfer, 4) ICU admission, or 5) surgery on the head, chest, abdomen, or vascular system. Exclusion criteria included isolated orthopedic injury to the extremities due to same level falls, overexertion injuries, electrocution and other miscellaneous injuries.

Results: 39,729 (36.9%) of 107,549 injuries were due to traumatic falls. The incidence of fall increased by 94% from 2005 to 2014, and has become the leading cause of trauma in the state of Oklahoma accounting for 43.2% of all traumas. Females were 51.9% of patients. The mean age was 57 ± 29.4 years, and mean injury severity scale was 9.16 ± 6.2. ICU admissions were required for 20.1% of patients. At discharge, 36.3% of patients went to another care facility (Rehab, SNF, or LTAC). The mortality of patients with falls was 4.2% and intracranial bleeding was present in 60% of these deaths.

Conclusion: In the state of Oklahoma, traumatic falls have become the most common etiology of fatal and non-fatal injury. Prevention strategies have been shown to be effective in reducing the number of falls in our older population. By increasing health care provider and patient awareness of this problem, the number of falls in the state of Oklahoma can be reduced with the application of these appropriate prevention strategies.

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OUTCOMES AND PROGNOSTIC FACTORS OF LOCALIZED, RESECTED MALIGNANT SALIVARY GLAND TUMORS: EXAMINING A SINGLE INSTITUTION’S 12-YEAR EXPERIENCE TO DISCOVER INDICATIONS FOR ADJUVANT CHEMOTHERAPY.

**Purpose:** To determine prognostic factors that portended poor survival for patients with resected salivary gland malignancies (SGMs) in an effort to determine which patients may benefit from adjuvant chemoradiotherapy.

**Background:** SGMs are a rare and heterogeneous group of tumors. Despite post-operative radiotherapy, survival outcomes remains poor in patients with tumors containing multiple poor prognostic factors. Adjuvant chemoradiotherapy has been shown to improve control and survival outcomes in squamous cell carcinomas of the head and neck with positive margins or extracapsular extension. However, no randomized, prospective data exists on adjuvant chemoradiotherapy for salivary gland malignancies.

**Methods:** Patients who underwent curative resection with or without adjuvant radiotherapy between 2002 and 2014 were identified and retrospective chart review was performed. Bivariate analysis was performed on continuous variables using Analysis of Variance. Chi-Square analysis and Fishers Exact Tests were performed on categorical variables. To evaluate the overall survival (OS) and disease-free survival (DFS), Kaplan-Meier curves and log-rank tests of homogeneity were used.

**Results:** Overall, 99 patients met inclusion criteria. Median follow-up time was 46.8 months. Univariate analysis revealed male sex, smoking history ≥ 10 pack-years, high grade, stage III-IVB, squamous cell histology, and perineural invasion significantly impacted OS and DFS. High-risk histopathology significantly impacted DFS and trended towards poor OS. Positive resection margins trended towards significantly impacting DFS. Multivariate analysis revealed only male sex and perineural invasion significantly impacted OS and DFS.

**Conclusion:** Survival outcomes remain poor for patients with high-grade, late-stage tumors with perineural invasion. Specifically, perineural invasion is a poor prognostic factor regardless of age, histology, stage, and grade. Males and patients with a smoking history ≥ 10 pack-years have worse survival outcomes with male sex being a more influential prognostic factor. Notably, this is the first study to quantify patient’s smoking history in SGMs and assess the impact of pack-year smoking history on survival outcomes. With longer follow-up or larger sample size, high-risk pathology may become significant influencer of OS in addition to DFS and positive resection margins a significant influencer of DFS given observed trends. Adjuvant chemoradiotherapy should be evaluated in patients with the above-mentioned characteristics, specifically high-grade, late-stage disease with perineural invasion.

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ARE ECCENTRIC EXERCISES EFFECTIVE FOR THE TREATMENT OF ACHILLES TENDINOPATHY?

**Purpose** Review the evidence for using eccentric exercise to improve Achilles tendinopathy outcomes.

**Methods** OVID Medline, PubMed, and Cochrane databases were searched for studies published between 2006 and 2016 using terms eccentric exercise and tendinopathy.

**Results** A 2009 systematic review of 16 randomized control trials (RCTs) examined the nonoperative treatment of mid-portion Achilles tendinopathy (AT). Using change in numeric pain score as the primary outcome, the relative benefit of several interventions were assessed. A
statistically significant decrease in pain score of eccentric exercise compared to the control (P<.05).
A 2015 systematic review examined the optimum dosing regimen of eccentric exercise in treating chronic mid-portion AT. The analysis included 14 RCTs and evaluated the Alfredson or similar exercise protocols for effective training parameters. Thirteen studies noted significant improvement in intervention groups for pain and function compared to control groups. However, no definitive conclusion for the most effective training parameters could be made due to the heterogeneity in study populations and outcome measures.
A 2013 systematic review of 32 studies compared eccentric loading programs for the treatment of AT and patellar tendinopathy. Four studies compared AT loading programs. One of the 4 studies reported evidence supporting improved patient satisfaction and return to preinjury activity with eccentric exercise compared to concentric exercise (82% versus 36%; P=.002). The other 3 reported varied results for pain reduction and return to activity.
A 2013 systematic review of 14 studies of adults diagnosed with insertional AT examined surgical versus non-surgical interventions for insertional AT. These trials evaluated patient satisfaction and reduction in visual analogue scale (VAS) pain score for five surgical techniques, full range of motion and floor level eccentric exercises daily for 12 weeks, and other non-surgical techniques. Eccentric exercise was noted to have significantly decreased VAS of 2.7 points (weighted mean) on a 10-point scale, however, it had low patient satisfaction (42% extremely satisfied and satisfied) compared to other interventions (satisfaction range 73-89%).

**Conclusion** Eccentric exercises are an effective treatment for pain reduction and functional improvement of Achilles tendinopathy. No definitive conclusion for the most effective training parameters can be made. There is conflicting evidence of patient satisfaction for eccentric exercises compared to other therapies.

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**DOES PROPHYLACTIC USE OF KNEE BRACES REDUCE INCIDENCE OF KNEE INJURIES IN FOOTBALL PLAYERS?**

**Purpose:** Review the evidence for using prophylactic knee braces (PKBs) to reduce the incidence of knee injuries in football players.

**Method:** PubMed, OVID Medline, and Cochrane databases were searched for studies published between 2008 and 2014 using terms prophylactic knee braces and American football players.

**Results:** A 2010 systematic review of 6 studies of high school and college football players evaluated the utility of prophylactic knee bracing to prevent knee injuries. The studies varied in mandatory wear of PKBs, inclusion criteria of players with previous knee injuries, and type of PKB used. The results of the studies were inconsistent in determining the effectiveness of PKBs in reducing knee injuries. One study, the RCT, reported that braced players experienced significantly reduced knee injuries compared to non-braced players (relative risk reduction (RRR) 55.9%; 95% CI, 21.4%-75.2%). The 5 prospective studies varied in results with two studies reporting more knee injuries in players using knee braces compared to no braces. One of these studies reported 7.5 knee injuries/100 braced players compared to 6.1 for non-braced; no P value given. Three studies found no significant difference in injuries rates when comparing braced and nonbraced knees. A 2008 systematic review of 7 studies reviewed PKBs in the prevention of knee ligament injuries in college football players. The review compared knee injuries in players with and without use of PKBs. Outcome measures included ligamentous knee
injuries and medial meniscus injuries. Definitions of injury ranged from tissue damage and ligamentous laxity to inability to practice or play for 1 day. Four studies found an increase injury incidence with PKBs with relative risk increase (RRI) of 17% (95% CI, 19% to -71%), 49% (-31% to -69%), 114% (23% to -492%) and 42% (-18% to -70%). RRR was observed in 3 studies at 10% (36% to -26), 58% (25% to 76%) and 56% (13% to 77%). Two studies from each group were statistically significant based on RRI or RRR. The American Academy of Orthopaedic Surgeons 2014 Evidence-based Guideline on the Management of Anterior Cruciate Ligament Injuries stated there is insufficient evidence to support the use of PKBs to decrease the incidence of ACL injuries (limited evidence; based on one moderate strength and one low strength study).

Conclusion: It is not clear if PKBs reduce the incidence of knee injuries in football players as the evidence supporting PKB use is inconsistent.
MINIMALLY INVASIVE TRENDS IN COMMON GENERAL SURGERY PROCEDURES FROM 2007-2013: AN ANALYSIS OF THE NATIONAL INPATIENT SAMPLE

Background: Minimally invasive surgical procedures have been progressively adopted over the past two decades. Laparoscopic procedures are being used increasingly for abdominal operations, and some open procedures have been replaced by their laparoscopic alternatives. This study was designed to review trends of laparoscopic versus open general surgical procedures in the United States.

Methods: A retrospective analysis of the 2007-2013 Nationwide Inpatient Sample (NIS) Healthcare Cost and Utilization Project (HCUP) database was performed. Patients who had appendectomy (excluding incidental appendectomy), cholecystectomy, colectomy, rectal resection, inguinal/femoral hernia repair, and ventral hernia repair were included. Patients were selected based on Diagnosis-Related Group (DRG) codes and ICD-9 codes for the primary procedure performed during each admission. Other laparoscopic procedures could not be identified based on available codes. 81,112 patients (6.9%) less than 16 years of age were excluded. Trends for each type of procedure were evaluated during the study period. The ChiSquare test (Mantel-Haenszel extension) was used for trend analysis.

Results: 1,098,072 patients were evaluated in the included six procedure groups. Laparoscopic cholecystectomy was performed in 86.8% of the cases in 2007 with a gradual, slight increase over the study period (90.4% in 2013). Laparoscopic appendectomies showed a significant increase from 67.2% in 2007 to 85.5% in 2013 (P<0.001). Laparoscopic colon and rectal resection were not identifiable in 2007 but increased over the study period; laparoscopic colectomies increased rapidly to 32.3% up to 2009 (P<0.001), and then increased slowly to 39.5% in 2013. Laparoscopic Rectal resection showed a linear increase to 9.8% in 2013 (P<0.001). Laparoscopic groin or ventral hernia repair was not identifiable in the 2007 dataset, but laparoscopic inguinal/femoral hernia and laparoscopic ventral hernia repair increased to 10.5% and 20.7%, respectively, in 2009 (P<0.001), and both plateaued from 2009 to 2013.

Conclusion: Laparoscopic cholecystectomy and appendectomy have been widely accepted and have essentially replaced their open counterparts. However, the percentage of laparoscopic inguinal and ventral hernia repair leveled off over the last four years of the study period at approximately 10% and 20%, respectively. The percentage of laparoscopic rectal resection and laparoscopic colectomy showed a very small increase over the last four years of the study period to reach approximately 10% and 40% of performed procedures, respectively. Through 2013, increases in laparoscopic colon and hernia procedures appear to have leveled off, leaving the open technique as the more common approach for these operations.

DOES FOOD INSECURITY INCREASE THE RISK OF METABOLIC SYNDROME?

Purpose Review the evidence regarding the influence of food insecurity on the risk of developing metabolic syndrome.
**Methods** OVID Medline and PubMed databases were searched for studies published between 2010 and 2016, using terms fruits, vegetables, produce, metabolic syndrome, food security.

**Results** A 2010 cross-sectional study of 3,113 adolescents and 6,138 adults with marginal, low, or very low food security (based on National Health and Nutrition Examination Survey [NHANES] Household Food Security Scale surveys from 1999 to 2006) compared metabolic syndrome (MetS) incidence to the population who were food secure. It was discovered that adults from households with marginal food security and very low food security were at increased risk of MetS compared with adults who were food secure. Adults from households with low food security and adolescents from households who fulfilled all criteria of food insecurity were not associated with increased odds of MetS compared to those with food security. A 2015 cross-sectional study of 7,435 adolescents aged 12-18 years with marginal, low, and very low food security based on NHANES surveys from 1999 to 2006 compared food security and its association to central obesity and other markers of MetS. It was discovered that adolescents from marginal food secure households were more likely to be overweight or obese than their food secure counterparts. Low food secure adolescents were more likely to be overweight and respondents who fulfilled the 3 levels of food insecurity were more likely to have central obesity.

**Conclusion** Adults who are marginal or very low food secure have an increased risk of MetS compared to adults who are food secure. Adolescents from marginal and low food secure households are more likely to be overweight or obese, while adolescents from marginal, low and very low food secure households are more likely to develop central obesity, a criterion for MetS.

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**EFFECT OF BRAF V600E MUTATION ON RADIOACTIVE IODINE UPTAKE AND DISEASE RECURRENCE IN PAPILLARY THYROID CARCINOMA**

**Objectives:** To determine if any significant difference exists between RAI uptake in BRAF+ vs. BRAF− Papillary Thyroid Carcinoma (PTC); and to describe the association between BRAF status (+/-) and additional surgery or RAI ablation.

**Methods:** 57 patients surgically treated for PTC at a major medical center were identified who underwent genetic testing for the BRAF V600E mutation, and who had also undergone RAI ablation therapy (BRAF+ n=36, BRAF− n=21). Median $I_{131}$ uptake (MCi) for each group was calculated, and then compared statistically using the Wilcoxon-Mann-Whitney test. The association of BRAF status (+/-) with additional surgery and repeat RAI ablation was assessed using Chi-square or Fischer’s Exact test, as appropriate.

**Results:** Within the BRAF+ cohort, the median RAI uptake was 152.65 MCi whereas within the BRAF- cohort the median uptake was 154.8 MCi. The difference between the two groups was not statistically significant ($p=0.804$). The proportion of BRAF+ subjects requiring additional surgery did not differ significantly from that of the BRAF- subjects (25% vs. 43%, respectively; $p =0.1618$). Similarly the proportion of BRAF+ subjects requiring additional RAI did not differ significantly from that of the BRAF- subjects (11% vs. 19%, respectively; $p =0.4490$).
Conclusions: The data from this ongoing study show no significant difference in I131 uptake between BRAF+/- PTC suggesting that the BRAF V600E mutation poorly affects disease prognosis by a mechanism other than poor I131 avidity. This preliminary data has also demonstrated that no significant association exists between BRAF status (+/-) and the need for additional surgery or BRAF status (+/-) and repeated RAI ablation.

Comments: The BRAF (V600E) mutation is the most frequent genetic mutation found in Papillary Thyroid Carcinoma, and has been correlated with a worse prognosis. It is hypothesized that BRAF+ PTC has less avidity for I131 causing less effective RAI ablation and leading to repeat surgery and RAI ablation.

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IMPROVING GUIDELINES-DIRECTED PREDIABETES MANAGEMENT – A QUALITY IMPROVEMENT PROJECT IN THE INTERNAL MEDICINE RESIDENT CLINIC

Introduction: American Diabetes Association recommends that patient with prediabetes should be referred to a behavioral counseling program targeting intensive diet and moderate physical activity. Metformin can be considered in selected patients. The aim of our projects was to improve the percentage of patients with prediabetes who are managed either by lifestyle changes or Metformin to 60% in the next 11 months.

Methods: We retrospectively reviewed charts of patients who had HbA1c between 5.7% and 6.4% in the last year. Looking at the previous office notes, we selected the patients who did not have a documented plan regarding prediabetes management. In the first PDSA cycle, patients were contacted and given appointment to discuss prediabetes. We created a patient information handout on prediabetes to help with educating them about their risks and what they can do to prevent progression to diabetes. Due to the various constraining factors, the initial patient scheduling system failed. Therefore, in the second PDSA cycle, we addressed prediabetes during regular patient office visit. We placed a physician alert in the EMR to help residents recognize the patients who needed to have the intervention. Since starting metformin requires the attention and care from their primary care provider, we defer initiating the drug to the PCP by sending a recommendation note to them.

Results: We identified 83 patients with HbA1c between 5.7% and 6.4%. 43% of patients had already have counseling about diet and exercise at previous visits. 6% of patients had Metformin prescribed. 49 patients were contacted by phone and 38 patients came for an office visit and were educated on diabetes prevention. This increased the percentage of patients who had prediabetes managed by lifestyle changes or Metformin to 93%. A total of 12 % were treated with Metformin

Conclusion: Data suggests that to prevent to progression to diabetes, patient with prediabetes should be in program targeting a weight reduction of 7% of body weight and at least 150 minutes of physical activity. To get there, we have to educate our patients first. We discovered many obstacles in accomplishing our goals such as team member coordination, high no-show rate and patient’s interest in spending time for the discussion. Out of this experience, our residents have gained better understanding of prediabetes management. Moreover, we have created a patient information handout that the clinic continues to use for our patients.
Extra Costs of Robotic Assisted Surgery in Minor and Major Surgeries: An Analysis of National Inpatient Sample

Background: Robotic assisted surgery (RAS) with its advantages is growing continuously. This study analyzed the extra costs of RAS in common surgical procedures using the National Inpatient Sample.

Method: Retrospective analysis of 2010-2014 Healthcare Cost and Utilization Project-NIS (HCUP-NIS) for the following laparoscopic/robotic procedures: cholecystectomy, incisional hernia repair, right and left hemicolectomy, sigmoidectomy, abdominoperineal resection, and total abdominal hysterectomy. Patients with other concurrent procedures were excluded. Hospital charges were converted to cost using hospital specific Cost-to-Charge ratios. MannWhitney test was used to compare costs.

Results: A total of 92,835 patients (89,125 laparoscopic, 3,710 robotic) were analyzed. Laparoscopic group cost was $10,270±8,910 versus $12,430±3,710 in robotic cases (p<0.001). Cost of laparoscopic versus robotic (percentage of increase) for each procedure were as follows: cholecystectomy $9,660 vs $10,980 (13.7%), incisional hernia repair $10,750 vs $13,440 (25.0%), right hemicolectomy $12,540 vs $15,030 (19.9%), left hemicolectomy $14,140 vs $18,110 (28.1%), sigmoidectomy $13,530 vs $16,700 (23.4%), abdominoperineal resection $17,730 vs $20,320 (14.6%), and total abdominal hysterectomy $9,340 vs $9,940 (6.1%). Costs of all RAS were significantly higher (p<0.001). Hysterectomy was the only procedure performed primarily using RAS.

Conclusion: RAS appears to create higher costs (6-28%) in comparison with conventional laparoscopic surgery. Extra costs may be lower in higher volume cases using RAS. Costs may depend on procedure complexity, case volume, and possibly surgeon learning curve. Further analysis of long-term outcomes (including reoperations and readmissions) is needed for better comparison of global treatment costs for both surgical approaches.
underwent major surgery. Vascular injuries were identified based on ICD codes of 900-904 and trends for each specific injury were assessed in the study time period.

**Results:** 2,591 patients (2.4%) of 107,549 patients were diagnosed with injuries to blood vessels. Significant mechanisms of injury in this subgroup included stabbing (26.2%), motor-vehicle collision (22.6%), and gun-shot wound (19.8%). Vascular injuries affected the head and neck in 562 patients (21.7%), thorax in 356 patients (13.7%), abdomen or pelvis in 537 patients (20.7%), upper extremities in 793 patients (30.6%), and lower extremities in 404 patients (15.6%). The most common injuries were specifically in radial/ulnar vessels (N=341), thoracic aorta (N=191), brachial artery (N=188), and carotid artery (N=163). Ten-year trend assessment indicated a significant increase in the diagnosis of carotid artery injuries from 3% to 8% (P=0.01), with motor-vehicle collision as the most common mechanism (38%).

**Conclusion:** Upper extremity vascular injury remains the most common vascular injury. Carotid arterial injury is being diagnosed increasingly in recent years, which may be due to a lower threshold for performing CT scans and other imaging studies. Disease registries can be used to prioritize public safety policy and also help define educational goals for surgical and emergency medicine postgraduate trainees. A high index of suspicion for traumatic vascular injury should be an important component of the training of general surgery and emergency medicine residents.

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**EFFECT OF PATIENT AND STAFF EDUCATION ON URINE CULTURE CONTAMINATION RATES**

**OBJECTIVE:** Primary: decrease the urine culture contamination rate of our population by instructing patients and staff on proper sample collection Secondary: look for associations between patient demographics like age, ethnicity, language, education level, BMI, parity and contamination

**METHODS:** A staff educational meeting held February 26, 2016, instructional posters placed in PNC patient bathrooms in English and Spanish. New obstetric patients were chosen as the patient population. A retrospective chart review of new OB patients from 2/29/16 to 1/4/16 was performed, with prospective collection from 2/29/16 to 4/29/16. Patient demographics were collected, and urine results were recorded as contaminated, no growth or UTI. There were 160 patients in each group. Ethnicities recorded as: White, Black or African American, Hispanic or Latino, American Indian or Alaska Native, Asian, Native Hawaiian or other Pacific Islander. Education level recorded as: Less than high school, high school/GED, some college, college degree. Gestational age in weeks and BMI to two significant figures were also collected. Data was put into RedCap, statistical analysis was performed using chi square test, Student’s t-test, Logistic regression analysis with P value <0.05, 95% confidence interval.

**RESULTS:** Urine culture contamination rate was found to be 45.00% before the education posters were placed, 48.13% after. This was not significant. Age (P 0.7800), Race/Ethnicity (P 0.2357), Parity (P 0.3758), Gestational age (P 0.1964) had no significant association to culture contamination. Language ( P 0.0156) and education level ( P 0.0259) were significantly associated. BMI had borderline association (P 0.0528). Spanish-speaking women were half as likely to have a contaminated urine culture (OR 0.50, 95% CI). This was true even after correcting for BMI and education level. The overall contamination rate was 46.56%, for patients with college degree it was 37.5%
CONCLUSION: The educational intervention did not improve contamination rates. Spanish language and higher education level were associated with lower contamination rates. The reason for this association is unknown.

DO ROUTINE EYE EXAMINATIONS REDUCE THE OCCURRENCE OF BLINDNESS FROM TYPE II DIABETES?

Purpose Review the current evidence supporting routine eye examinations, and the frequency of screening intervals recommended to reduce blindness in patients with type II diabetes.

Methods OVID Medline, PubMed, and Cochrane Review databases were searched from 2006-2016, using key terms type II diabetes, eye examinations, and blindness.

Results A 2013 systematic review of 15 studies examined varying intervals of eye screening for diabetic retinopathy (DR). Eight of the studies analyzed the relationship between frequency of screening and development of related eye disease over a timeframe of 1-10 years. The reported incidence of developing sight-threatening DR from no DR at baseline was 0.0-0.3% for a 1-2 year screening interval. A 5-10 year rate of blindness was 0.6%-1.8%. Overall, a 2-year screening interval for patients without background DR was found to be safe, with more frequent surveillance for those patients at higher risk. A 2009 retrospective 3-year cohort study used propensity score matching to compare diabetics with no prior diagnosis of DR who received guideline-recommended care to those who did not. Persons receiving recommended care with no prior eye complications were more likely to develop background DR than persons who did not receive care. Observations were made at 2, 3 and 6 months and 1, 2 and 3 years, with statistically significant results at all periods except 3 years. However, the likelihood of developing vision loss was reduced in patients receiving recommended care. Results were statistically significant at 1, 2 and 3 years. A 2006 observational study of patients diagnosed with type 2 diabetes used a multi-stage Markov model of actual screening study data to assess progression of DR among type 2 diabetics. Simulated results showed that the effect of screening intervals to reduce the occurrence of blindness decreased from 94.4% (95% CI, 91.6%-96.3%) for annual screening to 45.6% (45.0%- 46.1%) for a 5-year screening interval. The American Diabetes Association 2016 Standards of Medical Care in Diabetes supports eye exams every 2 years in patients with no evidence of retinopathy in one or more annual eye exams. The presence of any level of DR increases screening frequency to at least annually, or more frequently if DR is progressing to sight-threatening.

Conclusion The occurrence of blindness in type II diabetics can be reduced by routine eye exams. A minimum 2-year screening interval for diabetics without retinopathy at baseline screening may be appropriate, with a 1-year interval for those with higher grades of retinopathy.
Diabetes and its complications result in significant morbidity and mortality every year. Its management is a very important aspect in family practice. A vital component of the management of diabetes is monitoring the response to interventions via the Hemoglobin A1c (HbA1c). The aim of this study was to improve the rate of measuring HbA1c and thereby improve diabetic control among patients.

Methods
This quality improvement (QI) project was conducted in an academic primary care setting. Using a care team based approach; our module implemented pre-visit planning sessions (the Huddle) in which various aspects of chronic care management were discussed prior to each clinic session, to identify gaps such as routine HbA1c monitoring in appropriate patients and checking HbA1c inside the patient rooms. Current recommendations suggest checking the HbA1c every 3-6 months for this population. The rates of HbA1c surveillance were measured in the 3 months prior (7/12/16-10/11/16) to the day of implementation of the Huddle process (10/12/16) and compared with the rates of surveillance in the 4 months after (10/12/16-2/11/17). Exclusion criteria included: pre-diabetic and Type 1 diabetic patients.

Results
From 7/12/16 to 10/11/16, a total of 328 Type-2 Diabetics were seen in our module, out of which 206 (62.8%) received an HbA1c check within the 90 days prior to their office visit for routine surveillance. The HbA1c measurement rate after the date of implementation of pre-visit planning, was 71.8% (287/400) for the next 4 months, from 10/12/16 to 2/11/17.

Conclusions
As shown in this study, the integration of a pre-visit planning process in our daily workflow using a care team based approach has substantially improved the rates of HbA1c surveillance in our patient population, enabling the providers to make timely recommendations to the patients to improve the control of their diabetes. Data collected during the process of this QI project highlights the gaps in diabetic surveillance and supports the implementation of the Huddle process to improve patient care and outcomes. Despite these encouraging preliminary results, this project exposes the labor intensive and time consuming process of manually collecting data on a daily basis to facilitate better surveillance. Thus, we are hopeful this study will encourage integrating the pre-visit planning process into the electronic health record; prompting providers automatically when a patient is due for an HbA1c check to keep the process sustainable over the long term.

A.S. Bowling, B. Hall, M. Woslager, A. Shipman, M. Condren, H. McIntosh, Pediatrics, OU School of Community Medicine, Tulsa, Oklahoma, UNITED STATES; MEDICATION RECONCILIATION FOR PEDIATRIC PATIENTS WITH CHRONIC ILLNESS IN AN ACADEMIC PEDIATRIC PRIMARY CARE PRACTICE

Background: In today’s healthcare environment patients can receive care in numerous non-integrated healthcare settings. This is especially pertinent for the growing population of medically complex children, who often require care from multiple specialists and extensive medication regimens.

Objective: The goal of this study is to determine the frequency and significance of medication list discrepancy across care transitions for children with complex and non-complex chronic conditions, in order to develop a sustainable model for managing pediatric patient care needs across healthcare settings.
**Design/Methods:** A retrospective chart review of a newly developed Medication Reconciliation Across Care Transitions (MRAT) program led by pharmacists in an academic pediatric clinic was completed. The MRAT involves completing chart reviews and contacting patients upon receiving external consult notes or hospital discharge summaries for patients receiving primary care at the clinic to ensure accurate medication lists. Reconciliations completed between Jan 1 and Sept 30, 2016 for patients 0-18 years of age with complex and non-complex chronic conditions were included. Data collected included demographics, episode of care information, types of medication discrepancies, time spent, and corrective actions taken.

**Results:** During the study period, 85 medication reconciliation encounters occurred, of which 75% were consult appointments. Total time required for chart review between complex and non-complex chronic patients was statistically significant (t=-2.123, df=83, p=0.037) with a mean of 27.9 versus 19.8 minutes, respectively. Total number of medication discrepancies between complex (267 discrepancies) and noncomplex (99 discrepancies) patients was statistically significant (t=-2.990, df=83, p=0.004) with a mean of 5.1 versus 3.0 per patient, respectively. The three most common discrepancies found were missing medication (169), new medication added (89) and dosage change (67).

**Conclusion(s):** Medication reconciliation is critical for safe pediatric patient care. Complex chronic patients require greater time to complete reconciliation and have more discrepancies compared to non-complex chronic patients during care transitions between the pediatric medical home, hospital, and consult visits. With changes to medication regimens being common in these patients, organizations should consider ways to ensure accurate medication lists across care transitions.

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**Kellie Sisco, Pharm.D. Candidate; Michelle Condren, Pharm.D., BCPPS, AE-C, CDE; Brooke L. Gildon, Pharm.D., BCPS, BCPPS, AE-C**

**ASSESSING THE AMERICAN ACADEMY OF PEDIATRICS CRITERIA FOR ELECTRONIC PEDIATRIC PRESCRIPTIONS**

**Background:** Many institutions are turning towards electronic prescribing. However, even with electronic prescribing, errors are still frequent among pediatric patients. In 2013, American Academy of Pediatrics published an article with a list of criteria to improve electronic prescribing for pediatric patients. With these criteria, errors in prescribing should be reduced.

**Methods:** We analyzed a minimum of 300 prescriptions from 3 clinics with unique electronic prescribing systems. Clinic 1 was staffed with pediatricians while Clinic 2 was a teaching facility that involved prescriptions written by medical residents during their training. Each electronic health record (EHR) was assessed for compliance with AAP requirements. Additionally, two pharmacists examined the prescriptions for errors, and a physician adjudicated any differences between the reviewers. The primary outcome was to determine how many errors were preventable if AAP criteria were met by the EHR. Secondary outcomes were to determine preventability rates according to drug class, route of administration, and error type.

**Results:** Two clinic assessments have been completed. At Clinic 1, four out of 19 AAP criteria were met and 4 were partially met. A total of 351 prescriptions were analyzed with 46 errors found (error rate 12.3%). If Clinic 1 had an electronic system that met AAP criteria, 88% of errors could have been avoided. At Clinic 2, five out of 19 AAP criteria were met and 5 were partially met. A total of 408 prescriptions were analyzed with 36 errors found (error rate 8.8%). If Clinic 2 had an electronic system that meet AAP criteria, 83.3% of errors could have been prevented. At
both clinics, medication underdose was the most common error at 44%. The clinics varied in
drug classes with errors, but they also varied in drug classes prescribed.

Discussion: The error rates of both clinics could have been significantly reduced if the AAP
recommendations were included as part of their electronic prescribing system. Implementation
of the AAP requirements for electronic prescribing for children can reduce prescribing errors
significantly. The adoption of EHR systems that are more pediatric appropriate could improve
medication safety and efficacy for pediatric patients.

Shawn Sood, Nasir Mushtaq, Phillip Barton

NEURALLY ADJUSTED VENTILATORY ASSIST IS ASSOCIATED WITH GREATER FIRST TIME
EXTUBATION SUCCESS IN POST-OPERATIVE CONGENITAL HEART DISEASE PATIENTS WHEN
COMPARLED TO CONVENTIONAL MECHANICAL VENTILATION

Objectives: To assess initial extubation success rates in postoperative patients with congenital
heart disease utilizing two different mechanical ventilatory modes: neurally adjusted ventilatory
assist (NAVA) and synchronized intermittent mandatory ventilation pressure-regulated volume
control with pressure support (SIMV-PRVC). Secondary outcome variables included total
mechanical ventilatory days, total days requiring inotropes, sedation and analgesia, and overall
Pediatric Intensive Care Unit (PICU) length of stay between the two groups.

Design: A non-randomized experimental design with historical control group utilization

Setting: Level I twenty bed PICU

Patients: The study population included 78 patients aged 3 days to 54 months (mean age 3.2
months) who have congenital heart disease (CHD) and required cardio-pulmonary bypass for
corrective/palliative surgery and conventional mechanical ventilation (SIMV-PRVC) for a
minimum of 96 hours postoperatively without the ability to be weaned clinically or by blood gas
analysis.

Interventions: Initially all patients were ventilated on SIMV-PRVC with pressure-support for a
minimum of 96 hours. When ventilator weaning was clinically appropriate, the prospective study
group utilized the NAVA mechanical ventilatory mode for weaning. The historical control group
remained on SIMV-PRVC with pressure support during the length of mechanical ventilation until
extubation. Both groups were weaned on the same standardized PICU mechanical ventilator
weaning protocol.

Measurements and Main Results: The NAVA group (n = 36) demonstrated a significant
difference in successful first time extubation compared to SIMV-PRVC historical control group (n
= 42) (94.44% vs. 76.19%; p = 0.0259). The NAVA group demonstrated less mechanical ventilator
days (10.92 ± 5.55 vs. 14.02 ± 7.68; p = 0.0473), shorter PICU length of stay (12.47 ± 7.32 days vs.
17.71 ± 9.01 days; p = 0.0067), fewer inotropic support days on Dopamine (10.22 ± 6.00 vs.
14.19 ± 8.19; p = 0.0186) and Milirone (11.11 ± 6.49 vs. 15.74 ± 8.51; p = 0.0094) and fewer days
on sedative/analgesia of midazolam (10.36 ± 6.54 vs. 15.17 ± 7.78; p = 0.0046) and fentanyl
(11.58 ± 7.01 vs. 16.55 ± 8.12; p = 0.0054).

Conclusions: In postoperative congenital heart disease patients who required cardiopulmonary
bypass and conventional mechanical ventilation for a minimum of 96 hours postoperatively
without the ability to be weaned, NAVA ventilation was associated with a greater initial
extubation success rate and fewer days on mechanical ventilation, inotropes,
sedation/analgesia, and overall shorter PICU length of stay when compared with the SIMV-PRVC
ventilation mode for mechanical ventilatory weaning. These findings support future prospective,
randomized control trials comparing NAVA and conventional mechanical ventilation in postoperative congenital heart disease patients. NAVA should be considered as a therapeutic option for postoperative mechanical ventilator weaning in congenital heart disease patients. There are no reported conflicts of interest or financial disclosures by any of the authors regarding this abstract. All authors approved the final abstract as submitted and agree to be accountable for all aspects of the work.

22 Andrew Starnes, Cordell Baker, Babawale Oluborode, Curtis Knoles MD, Boyd Burns MD, Kenneth Stewart PhD

GROUND AND AIR AMBULANCE UTILIZATION IN DIRECT TRANSPORT TO A MAJOR TRAUMA CENTER FOR PEDIATRIC PATIENTS IN OKLAHOMA

Background: Traumatic injury is the leading cause of mortality in children and the most common cause of emergency medical services transport in pediatric populations. Appropriate triage to air or ground ambulance is important, as nearly half the US pediatric population live over 50 miles from a level I or II trauma center but air ambulance use results in far greater costs. We aimed to determine which factors are associated with utilization of air over ground ambulance within the State of Oklahoma.

Methods: Retrospective cohort data were obtained from the Oklahoma State Trauma Registry for patients under age eighteen transported by ground or air ambulance directly from the scene of injury to a level I or II trauma center within Oklahoma between 2009 and 2016. Variables such as demographics, injury type, and outcomes were included. Bivariate and multivariable analyses were conducted to identify factors associated with the decision to transport patients by air.

Results: A total of 4,644 patients met inclusion criteria, of which 74.6% (n=3465) were transported by ground and 25.4% (n=1179) by air. Female gender and adolescent age were more likely to receive air transport in bivariate analysis, but not after controlling for confounders. In bivariate analyses the odds of air transport were significantly higher among vehicle-associated vs. fall-related injury (OR 4.32, 95% CI 3.27 – 5.71), blunt vs. penetrating injury (OR 2.37, 95% CI 1.81 – 3.11), and multisystem vs. single injury (OR 1.65, 95% CI 1.59 – 1.69). This significance persisted with multivariable analysis.

Conclusion: After controlling for confounders, the most significant observed predictors of triage to air transport were injury-related variables. Further analysis is needed to compare outcomes between modes of transport and examine reasons for air transport observed in low-acuity patients.

23 Susan Studebaker, Nasir Mushtaq, Eden Hemming, Tiffani Mabe, Emily Dunn, Mohamed Eslam

HPV RATES IN A UNIVERSITY CLINIC

Background Our outpatient academic clinic has a significant adolescent population and we vaccinate a large amount of patients every day. We feel that our clinic vaccination rates are high. We chose to focus on the Human Papillomavirus vaccine to examine our theory.

Objective To explore in detail our HPV eligible patient population and to determine what factors are associated with higher completion rates of the HPV vaccination series.

Design/Method HPV vaccination data was collected from every patient receiving at least one dose from January 1, 2015 until April 7, 2015 for a total of 300 distinct individuals. Factors
associated with completion of HPV vaccination were examined by comparing those who completed three doses of HPV vaccines to those who had one or two doses. Sociodemographic factors and other variables including duration between two vaccines (number of days), insurance, and type of visit were examined. Student's t-test was used for continuous variables and Chi square test of independence or Fisher's exact test were employed to evaluate association between categorical variables and completion rates. Significance level of 0.05 was used for all the statistical analysis.

**Results** HPV completion rate was 71.7% and 90% of the study participants had two or more doses of HPV vaccine. 46% of the study participants were Hispanic whites and 35% were non-Hispanic whites. Mean age of the sample was 12.1+1.78 and there was approximately equal proportion of males (48%) and females (52%). Completion was slightly higher among males (74%) than females (70%), however this difference was not statistically significant. Similarly, those who completed three doses were younger in age (11.96+1.66 vs. 12.42+2.01, \(p = 0.06\)). Shorter duration between first and the second dose was significantly associated with overall completion (\(p = 0.0003\)). Furthermore, type of visit for the second dose had statistically significant association with completion (\(p <0.0001\)): acute visit or nurse visit had higher completion rates (88% and 87%, respectively) as compared to well child checkup (48%). Stratified analysis showed similar associations among males and females.

**Conclusion** Factors highlighted in our study include higher immunization rates in males that are not shown nationwide. And the fewer days between the first and second dose indicate completion of the series in a timely manner. Employing nurse visits and acute visits to finish the series over waiting for the next well check up was important to finish the three dose series.

24 Krishna Suthar, MSIV; Kristin Foulks-Rodriguez, MPH; Joshua Davis, MSII; Scott Davis, MSII; Zach Ferguson, MSII; Thomas Briggs, MSIV; Martina Jelley, MD, MSPH, FACP

**ADVERSE CHILDHOOD EXPERIENCES IN ADDICTION MEDICINE PATIENTS RECEIVING BUPRENORPHINE THERAPY**

**Background:** It is well established that adults with a significant history of adverse childhood experiences (ACEs) are more likely than their non ACE-affected counterparts to experience adult health outcomes. In a prior study conducted at the University of Oklahoma School of Community Medicine (OUSCM) in 2012, a team of ACE researchers gathered data on 354 patients in Internal Medicine, Family Medicine, and Community Health that indicated the prevalence of ACEs was higher (0-1 ACE, 35.5%; 2-3 ACEs, 27.3%; 4 or more ACEs, 37.2%) than the cohort examined in the original CDC ACE study (0-1 ACE, 62.1%; 2-3 ACEs, 25.4%; 4 or more ACEs, 12.5%). Data from the original ACE study also indicate that individuals with exposure to 4 or more ACEs have a 7- to 10-fold increased risk for drug abuse and addiction compared to their non ACE-affected peers. Data from the OUSCM study indicated a mean ACE score associated with any substance abuse in our patient population of 3.62. Having experienced traumatic events has been acknowledged as a significant risk factor for substance abuse. To our knowledge, there is no available literature examining the prevalence of ACEs in patients treated for substance use disorder with buprenorphine.

**Methods:** We conducted a survey of current adult patients in the OU addiction medicine practice to determine the prevalence of ACEs in patients treated for substance use disorder with buprenorphine. Patients were approached to complete the self-administered survey during a regular clinic visit with their addiction medicine physician. The survey included demographics,
ACE screening questions, and information about the patient’s substance use history.

**Results:** Forty-eight patients of 61 approached (78.7%) completed the survey. Analysis indicated that 20.8% of these patients had experienced 0-1 ACE, 20.8% 2-3 ACEs, and 58.3% 4 or more ACEs. The prevalence of 4 or more ACEs in this sample of patients is much higher than the OUSCM (37.2%) or CDC (12.5%) samples. The mean ACE score was 4.52. Patients in this sample reported high levels of several of the ACE categories: Emotional abuse (52.1%), emotional neglect (47.9%), parental divorce (71.1%), household alcohol or drug abuse (78.7%), household depression (47.9%), and family member incarceration (29.2%).

**Conclusions:** We found that the prevalence of ACEs in a sample of patients treated for substance use disorder with buprenorphine is much higher than in the general population. Screening for ACEs in this population and investigating treatment approaches that include ACE awareness deserves further study.

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**ABOVE KNEE AMPUTATION INCISIONS CAN BE ACCURATELY DEFINED USING INTRAOPERATIVE CIRCUMFERENCE AND DIAMETER MEASUREMENTS**

**INTRODUCTION:** Selection of incision locations for above-knee amputations (AKA) has been more of a surgeon’s clinical judgement rather than a science and has not been objectively evaluated. The incised muscle flaps must be long enough to cover the cut end of the thigh but not too long that redundant skin remains and the incision is disfiguring. We performed quantitative measurements on CT images to define optimal incisional lengths.

**METHODS.** The most common type of AKA flap is the anterior/posterior “fish mouth” (Figure 1). To decide where the incisions will be made, the thigh is treated as a circle (Figure 2) and the circumference is measured with a surgical suture. Half of this circumference is used to mark the base of both the incisional flaps. Thereafter, the anterior-posterior diameter of the thigh is measured (Figure 3) and divided in half to determine the radius of the thigh. This radius distance is used to define the length of each flap. In mathematical theory, the combined surface areas of these two flaps should adequately cover the entire cut end of the thigh (Figure 4). After IRB approval, we examined the CT cross-sectional images of 80 thighs of vascular surgery patients who had previously undergone CT imaging for clinical purposes. The anterior/posterior and medial/lateral diameters were digitally measured 10 centimeters superior to the patella at the usual site of above-knee amputations. Using NIH ImageJ software, we quantified the surface area of the thigh at this site and compared this to the calculated clinical incisional measurements derived from the thigh circumference and diameter.

**RESULTS:** The incisional flaps based on thigh circumference and diameter accurately predicted sufficient coverage of the amputated thigh. The measured cross-sectional surface area was 159 + 8 cm² (mean + SEM) compared to the calculated area of 156 + 8 cm² utilizing the averaged radius from both the lateral-medial and anterior-posterior diameters. This was only a 2% difference in surface area.

**CONCLUSION:** Incisions for above knee amputations can be accurately measured for surgical closure using intra-operative circumference and diameter measurements.
HYPERTENSIO N EDUCATION BY AMBULATORY BLOOD PRESSURE LOGGING THROUGH HOME –
THE HEALTH QUALITY IMPROVEMENT PROJECT

Introduction Hypertension costs the U.S. an estimated $46 billion each year. In addition, 1 of
every 3 American adults have hypertension yet roughly only half (54%) have their blood pressure
under control. As the cost to health care services is expected to rise, the utilization of data-
driven patient panel reporting can assist provider-initiated preventive strategies in lessening the
economic impact of hypertension. Observations from one novel approach, to increase home
blood pressure monitoring (HBPM) of patients may lead to substantial gains in improved quality
measures and overall outcomes. This project aimed to increase patient HBPM to at least 50%
over a 4 month period through provider-initiated utilization of continuity patient panel reporting
during routine clinic visits.

Methods All adults with a previous diagnosis of hypertension on established pharmacotherapy
were captured by a monthly continuity patient panel report belonging to a sole provider. These
patients were subsequently identified and solicited over the course of 4 months during routine
clinic encounters at an academic primary care clinic. At initial intake, a one-page questionnaire
was presented to all patients to gather baseline data. All respondents were then instructed to
perform daily HBPM and document their findings on an American Heart Association blood
pressure log for one month. A prescription for a blood pressure monitor was provided to those
without one at the initial clinic visit. Through 3 cumulative PDSA cycles and following an
approximate 30-day follow-up period, interval HBPM measurements, ancillary data and patient
feedback was collected for further analysis.

Results Twenty adult patients (mean age 54) were followed over the 4 month project period.
Initial qualitative analysis revealed 35% had uncontrolled hypertension according to JNC-8
guidelines. In addition to a 75% compliance rate with daily antihypertensive medication use, 40%
of participants were unaware of their target blood pressures and only 5% performed daily HBPM
at project onset. Despite a 35% loss to follow-up, HBPM exceeded target expectations to a total
of 61.5% in remaining patient panel by project end.

Discussion Incorporating continuity patient panel reporting to direct preventive aims in the
management of hypertension can empower both providers and patients to work together in
improving overall quality of care. This quality improvement project supports the idea of further
integrating continuity patient panel reporting towards chronic disease prevention strategies and
proves an invaluable tool in improving simple yet measurable outcomes.

EDUCATION

Amber Beisly, Adrien Malek

THE CONTRIBUTION OF CHILDREN’S SOCIAL AND EMOTIONAL CAPACITIES TO EARLY MATH
SKILLS

Background Early math skills are a key predictor of later math and reading achievement (Duncan
et al., 2007) and are influenced by various aspects of children’s functioning beyond intelligence
(McClelland et al., 2014). Approaches to learning, which includes competence motivation,
attention/persistence, and attitude toward learning, has been consistently linked with math
skills in children from pre-k to 5th grade (Li-Grining, Votruba-Drzal, Maldonado-Carreño, & Haas,
Children's social skills are related to math achievement, as it may prevent disruptive behavior that derails learning (Dobbs, Doctoroff, Fisher, & Arnold, 2006). Executive function requires skills such as cognitive flexibility, working memory, and inhibitory control (Blair & Razza, 2007). It enables children to have the sustained attention and problem-solving capabilities necessary for math. Despite the importance of social-emotional capacities as a foundation for learning, few studies have looked at how these capacities can uniquely contribute to early math skills (Doctoroff, Fisher, Burrows, & Edman, 2016). In this study we examined children’s approaches to learning, social skills and executive function in relation to preschool children’s mathematics skills, after controlling for key child and family demographic variables (e.g., parent education).

Methods
A total of 149 preschoolers, ranging from 31-65 months old, from childcare settings in a large urban setting participated in this study. The sample was diverse in terms of racial (37% White, 40% Black, 8% Hispanic) and socio-economic backgrounds. Teachers completed the Preschool Approaches to Learning survey (McDermott et al., 2002). Children’s math knowledge and skills were assessed with Woodcock-Johnson III: Applied Problem, Counting Proficiency Assessment (Woodcock, McGrew, Mather, & Schrank, 1977) and Brief Preschool Early Numeracy Skills Test (Purpura, Reid, Eiland, & Baroody, 2015). Children’s executive function was assessed via a Head, Shoulders Knees and Toes task (McClelland et al., 2014). Parents completed a survey rating their child’s social development.

Results and Discussion
Preliminary results of bivariate correlations among the main variables show that social skills, executive function, competence motivation and attention/persistence were significantly positively correlated with both math measures. Multiple regression analysis was used to test whether social-emotional competencies significantly predicted children’s math scores. The results indicated five predictors explained 59.5% of the variance ($R^2=.595$, $F (14,149)=14.43$, $p<.01$). After controlling for child and family demographic variables, executive function ($β=.153$, $p<.001$) and social skills ($β=.388$, $p<.001$) significantly predicted math. Perhaps these capacities contribute to higher math functioning by allowing the child to sustain interest and flexibility essential in math activities (Dobbs-Oates & Robinson, 2012).
school support the teacher learner relational structure? The researcher utilized a phenomenological paradigm for the first round of data analysis. This paradigm focuses on the lived experiences of a phenomenon, a manifestation. In this case, inclusion is the phenomenon being analyzed via a teacher’s experience. This research project was a qualitative pilot study. Additional in-depth research studies would confirm, extend, or refute findings necessary to highlight and to provide discourse for future implications.

**Divya Byragani M.D., Jason Lo M.D., Michael Cloud M.D., Stephanie Harry D.O., Kavitha Mattaparthi M.D, Patrick Robinson M.D., Jemina Morales M.D., Kristin Rodriguez MPH LSSGB, Carmen Vesbianu M.D. University of Oklahoma- Tulsa.**

**IMPROVING ADVANCE DIRECTIVE DOCUMENTATION IN THE RESIDENT CLINIC- A QUALITY IMPROVEMENT PROJECT**

Research has shown that patients prefer to have an End of Life discussion in the outpatient setting initiated by their primary care doctor. However, completion of advance directive (AD) in a clinical setting is low due to the limited physician training, lack of time, or patient hesitancy to discuss this subject. Our aim was to increase the advance directives documentation to 20% by the end of May 2016 in the resident clinic.

**Methods:** We identified patients 65 and older in our panel. An advance directive template was already available in our EMR, but physicians and nurses were not aware of this. In the first PDSA cycle, we increased awareness of the EMR tool and educated residents on the use of AD and AD discussion techniques. Computerized reminders were used that prompted the physician to discuss AD during the visit. Physicians assessed the patients’ perception of current medical status and discussed the options with the patient and family, if present. AD packet was given to patients with the option of completing it at the visit or bringing it back at the next visit. These visits were coded under ICD 10 code Z71.89 (discussion of advance directive). The physician and nurse followed up with patients during the next visit to address questions and collect the advance directive. The AD was put into a specific folder in the EMR. Physicians re-reviewed their patient charts to see how many advance directives were documented.

**Results:** 117 patients 65 and older were identified in our panel. Only three (2.52%) had advance directives scanned in the EMR. 62% of patients came into the office for a visit in an 8-month period. 20% were seen by a different provider than the ones involved in the QI project. Out of the 62% of the patients that were seen by providers, AD was discussed with 60% of the patients. The rate of AD documentation in EMR increased to 3.4%.

**Conclusion:** Discussing Advance Directives with patients is not a common practice in our Internal Medicine resident clinic. Though we did not reach our aim, a conversation regarding Advance Directives took place with 60% of the patients. The main barrier in accomplishing our goal was inability to have the patients fill and return the documentation given at their visit. Our project also increase awareness of implementing AD in office practice among our IM residents.

**Casey Fitzgerald, Meredith Davison**

**STEP 1 PREPARATION**

Each year over 20,000 individuals take the USMLE Step 1 examination, a test designed to assess a second-year medical student’s ability to apply concepts essential to the practice of medicine. Topics included in the examination range from principles and mechanisms of disease to modes
of treatment. At many medical schools, passage of this examination is required prior to the initiation of the clinical training in medical school. However, it has become paramount not only to pass the examination but to also excel, as it is used by many residency programs to determine an individual’s competitiveness and thus likelihood of obtaining an interview at that residency program. Thus, to help promote success on the Step 1 examination, 185 current third and fourth year medical students at the OU College of Medicine and OU-TU School of Community Medicine were surveyed using the Qualtrics Survey. Students were surveyed regarding the resources used to study, the timeline of studying and testing, use of practice test and question banks, and environment of studying. Data were analyzed using descriptive statistics. Interestingly, more than 80% of students began studying for Step 1 early in the spring of their second year and more than 75% of students took their examination in the first half of June. Furthermore, the majority of students solely relied on 3 resources while studying: Pathoma, UWorld, and First Aid, and more than 50% of students completed more than 2k practice questions and 1-3 practice tests. In summary, the study indicated that the students surveyed were remarkably consistent in their opinions regarding preparation for Step 1.

Sarah Flanders, Heath Mueller, Sara Coffey

SCHOOL BASED MENTAL HEALTH SERVICES THROUGH A TRAUMA INFORMED LENS

Introduction Nearly half of all children in the United States are exposed to an adverse childhood event. In Oklahoma, it is reported that a child is neglected or abused every hour and 24.7% live in poverty. When children are exposed to traumatic events they can exhibit disruptive behaviors. In one study, disruptive behavior was endorsed by approximately 50% of teachers as the largest mental health problem facing their school, and consistently cited their lack of training and information as a barrier to improving these issues.

Methods Our intervention consists of 2 separate contributions. First, child and adolescent psychiatrists and fellows offer group supervision in the school setting. The group supervision is on a voluntary basis and is open to all teachers, staff and administration at the intervention school. Professional development on several topics is also provided to the teachers to further support their needs. Included topics are selfcare, aggression, oppositional behavior, self-care and mindfulness.

Procedures An intervention and control school, both elementary schools in the same public school system will receive a pre and post survey. The survey asks for demographic data and information about problem behaviors in the classroom. The intervention began in November 2016 and is taking place once a month on Thursday mornings. Following the intervention a post-survey will ask both the intervention group and the control group about their experiences managing disruptive behavior in the classroom. The control group will not receive interventions including consultation or professional development from our child psychiatry team.

Conclusion In Oklahoma abuse and neglect continue to be on the rise. These adverse childhood events are reflected in children’s’ behaviors. They can be harder to parent and teach; exacerbating the problem. Daily stressors, regulations, mandates and problematic behaviors in the classroom continue to mediate stress and well-being in teachers. Providing an alternative view and helpful skills for teachers to manage these stressors is imperative. Our hope is that the success of this program will encourage the whole of the public school system and others in the surrounding area to incorporate mindfulness in the school setting.
PTSD IN SURGICAL RESIDENTS: EVERYBODY HURTS... SOMETIMES

BACKGROUND The prevalence of Posttraumatic Stress Disorder (PTSD) among trauma surgeons has been demonstrated to be higher than the general population. Physician Burnout (PBO) is also on the rise. Given the potential overlap of these syndromes, we aim to evaluate the prevalence of PTSD, its association with PBO, and potential risk factors for PTSD among surgery residents.

METHODS A cross-sectional national survey of surgery residents was conducted. Screening for PTSD was performed using the Primary Care PTSD Screen (PC-PTSD). Three or more positive responses to the PC-PTSD screen were considered positive for PTSD (PTSD+). Causative traumatic stressors associated with PTSD were queried. Eighteen variables were examined as possible PTSD risk factors which included demographics, residency characteristics, physician burnout, and resident wellness. A chi-square or Fisher’s exact test were employed for statistical significance in large or small sample sizes, respectively.

RESULTS From September to October 2016, 582 surgery residents completed the survey. A PTSD+ screen was noted in 22% of respondents (n=113) and 57% reported symptoms of PTSD. Traumatic stressors were more common in the first postgraduate year with decreasing frequency as experience increased. The most common traumatic stressor was bullying, followed closely by overwhelming work responsibilities, exposure to trauma, and work-life discord. There were no statistically significant demographic variables. Of the residency characteristics, an increase in average hours of work per week was found to be associated with increasing prevalence of PTSD (p<.001). Overall, 35% of respondents screened high risk for PBO. The emotional exhaustion and depersonalization subcomponents were positive in 23% and 29% respectively. PTSD+ respondents were associated with increased prevalence of PBO (p<.001). Less than 2/3 of residents screened healthy in any wellness category. Feeling unhealthy was associated with increased prevalence of PTSD (p=.001).

CONCLUSION Prevalence of PTSD among surgical residents (22%) was found to be three times that of the general population. Contrary to our hypothesis, the primary traumatic stressor reported was not due to exposure to trauma patients. Rather, bullying and overwhelming work responsibilities were reported more frequently as the inciting event. Increased work-hours, burnout, and reduced resident wellness was associated with increasing prevalence of PTSD. Given the apparent relationship between PTSD and PBO, strategies should be considered to mitigate these syndromes. An increased focus on resident wellness may be the simplest solution to reduce PTSD and PBO with hopeful translation into long-term sustainability and improved overall healthcare.
EXAMINING THE INFLUENCE OF CULTURAL IDENTITY ON THE FORMATION OF INSTRUCTIONAL PHILOSOPHIES OF TEACHERS OF DUAL LANGUAGE LEARNERS

The phenomenological research study examined the experiences of three early childhood educators with diverse cultural backgrounds and the ways in which those cultural identities shaped their instructional philosophies of dual language instruction. The research included case studies of two bilingual teachers who immigrated with their families to the United States when they were between the ages of 4 and 5. They both attended public preschool as dual language learners. One of the teachers was born in Puerto Rico and the other was born in Vietnam. A third perspective considered in this research study was that of the researcher who was born in the United States and is a monolingual English speaker with no experience as a dual language learner. The study examined the significant influences (cultural, familial, and educational) that contributed to the formation of each teacher’s instructional philosophy of dual language instruction. Each educator participated in a series of interviews about their cultural identities and development as educators. The educators’ experiences were analyzed through the sociocultural conceptual framework including Vygotsky’s Zone of Proximal Development (ZPD), Bruner’s scaffolding, and Culturally Responsive Instruction. Common and differing themes and nuances that emerged from the interviews were presented in an effort to make sense of the variety of ways in which cultural background shapes one’s philosophy of instruction.

Debbie Laurin

CAREGIVER-INFANT TODDLER INTERACTIONS DURING DIAPERING: ASSOCIATIONS WITH WELL-BEING AND INVOLVEMENT

Background Findings from this study contributes knowledge about an under-studied research topic in the early childhood professional literature with a population targeted for services designed to enhance their development and well-being in Early Head Start settings.

Methods This quantitative correlational study investigated using the Parenting Interactions with Children: Checklist of Observations Linked to Outcomes (PICCOLO; Roggman, Cook, Innocenti, Norman, & Christiansen, 2013) and the Leuven Involvement Scale (LIS) (Laevens, & Heylen, 2004). Two observers simultaneously recorded data, one using the PICCOLO and the second observer using the LIS to assess caregiver–infant/toddler interactions and child well-being and involvement experienced during diapering routines at three large Early Head Start Midwest childcare centers in 33 infant and toddler classrooms. One hundred thirteen infants and toddlers (ages 6 weeks-36 months) were observed during two diapering cycles per child, in a three-hour morning period, using the Leuven Involvement Scale. Fifty caregiver interactions with infants and toddlers during diapering routines were coded for responsiveness, affection, encouragement, and teaching, using the PICCOLO. Selection criterion for this study included, all children, who still required diapering, fulfilled the sampling criteria. OU-IRB approval was secured and parent consent for child participation and caregiver consent was obtained.

Results To establish preliminary reliability for use of the PICCOLO to measure infant’s/toddlers’ individual experiences of caregiver–child interactions, Cronbach’s α will be calculated for each subscale. RQ1: Is the association between caregiver interactions and child well-being mediated by involvement? Based on t-tests and ANOVA will determine if PATH analysis will be run. RQ2: Is there a difference between 2 time points (all 3 caregivers) when children are changed by different caregivers? I will conduct independent t tests to determine the variance between different caregivers in diapering cycle 1 and 2. RQ3: Is there a difference in caregiver interaction
determined by caregiver position? I will run ANOVA to determine if there is a difference in interactions by caregiver position. Results, in terms of psychometric properties, may indicate promise for using these measures to observe caregiver interactions and child well-being and involvement in infant and toddler group setting diapering routines. No conflict of interest in this study exists.

35 Kimberly D. Phillips, ILAC Doctoral Student University of Oklahoma- Tulsa Research Forum Submission, spring 2017

How Can an Advocate Be Heard: Making the Case for Inclusive Preschool Classroom?

Politics and culture change needs to take place for this question to be answered and real change to take place. Postmodern identifies individuals as social beings constructed by systems they inhabit. In this pilot study, the advocate plans to work with students that are diagnosed with special needs and feels that a cultural shift needs to happen where inclusion is put in the spotlight, not on the backburner. Two themes emerged from this pilot study. The first theme is that an advocate has to have a voice that is heard by the parent and school for change to happen. According to post modernism, mainstreamist believe that they are the way, the hope, and the light. Mainstreamist have valid ideas and have made strides where inclusion comes into play but have fallen short with the follow-through. The second them is empowering the parents. Parents have a strong voice and know the needs of their children better than anyone knows. Some parents can easily become caught up in the politics of public education and feel pressure to conform. As any self-respecting postmodernist would agree that, we construct the truth from a societal prospective. This study proved that if more education and awareness were readily available, inclusion would not be a topic of discussion. Inclusion would happen in every district, in every school, and in every classroom. The surprising discovering from this study is a reappearing theme that society and teachers need more information on special needs for acceptance to happen and for stereotypes to be shattered. A change in culture must occur and the time is now for change to happen. According to Paulo Freire, pedagogical action should be a political action. Nevertheless, a specific political action: action to make humans free (Ghiraldelli, 2000). This statement could easily be made less drastic and the action can be to make inclusion classrooms for all! Educational theorist Herbart said, “The way a child thinks is not wrong, but the child thinks a different way”. Perfect motto for the inclusive classroom.

36 Neal Sharma, MD, Keith Mather, MD Department of Pediatrics, OU-TU School of Community Medicine

THE RATE OF BURNOUT AMONGST PEDIATRIC RESIDENTS AND ITS IMPACT ON RESIDENCY PERFORMANCE

Background: OU-TU School of Community Medicine (SCM) Pediatric Residency Program is a member of the Pediatric Residency Burnout Resilience Study Consortium 2016 Annual Study that includes 34 training programs in the United State. Infrastructure for this multicenter, coordinated study was derived from this Consortium and with the assistance of the Association of Pediatric Program Directors Longitudinal Education Assessment Research Network (APPD LEARN).
Objective: Our study seeks to establish the rate of burnout in Categorical Pediatrics Residency Programs by training year and determine if the rate of burnout at OU-TU SCM is consistent with nationwide results. We also set out to evaluate the impact of burnout on resident performance measured by milestone achievement and domains of competence.

Results: Average rate of burnout amongst pediatric residents nationwide was 54% (n=1410) compared to 47% at OU-TU SCM (n=17, 77% response rate). Nationally, residents experiencing burnout decreased in prevalence each year of training: 58% PGY1, 54% PGY2, 48% PGY3. At OU-TU SCM, burnout increased in prevalence with each year of training: 29% PGY1, 40% PGY2, 80% PGY3. 1494 residents at 31 programs completed surveys measuring milestone data. Resident burnout lowered milestone achievement compared to non-burned out residents in patient care (2.96 vs 2.76 on a milestone scale of 1 to 5, -0.22 impact differential, p=0.001), systems based practice (2.86 vs 2.68, -0.18, p=0.004), problem based learning and improvement (3.24 vs 3.07, -0.17, p=0.006), professionalism (3.24 vs 3.07, -0.17, p=0.006), and interpersonal and communication skills (3.12 vs 2.93, -0.19, p=0.01). There were no significant differences in the competence of medical knowledge between burned out residents compared to non-burned out residents amongst PGY levels.

Discussion: Despite lower average rate of burnout at OU-TU SCM Pediatric Residency Program compared to national programs, our increasing prevalence of burnout with PGY level does not follow the decreasing prevalence of burnout nationwide. Burned out and non-burned out residents were similar in demographics, debt burden, and physical health. Our study identified factors protecting residents from burnout: current rotation, sleepiness, recent vacation or weekend off, and time since most recent medical error. Further studies are needed to investigate which of these protective factors differ from OU-Tulsa compared to programs nationally.

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ASSESSMENT OF THE GIRLSMATS WEBSITE AND ITS EFFECTIVENESS IN DECREASING RISK-TAKING BEHAVIORS AMONGST TEENAGE GIRLS

Teenage females today are a generation of individuals who want to experience situations immediately. Given the still developing prefrontal cortex of the brain in the teenage years (Johnson, 2009) that helps teens process consequences, an effective method of understanding consequences to a behavior prior to experiencing risky situations may alter a teen’s reaction to the incident, and allow them to respond more favorably towards behaviors affecting their health. The Girlsmarts website (www.girlsmarts.org) was built to allow teens to experience the consequences of high-risk behaviors and make choices as if were they were in this situation, by reviewing 7 cases that go over common high-risk taking behaviors. After the cases, the website encourages individuals to complete a voluntary and anonymous survey that requests information on demographics of viewers, as well as requests information on most useful and effective cases. Analysis of 47 surveys reveals the website was viewed by teenage girls 64.7% of the time, while it was viewed by a teachers/educators 29.4% of the time. The most common location of viewers within the United States included the NorthEast USA (58.8%). 94.1% of viewers reported that the cases did change their thoughts about how they handle certain situations. Viewers reported the cases on the topics of cyberchatting and date rape (64.7%), sexually transmitted infections and sexting (58.8%), and consequences of getting pregnant.
(52.9%) to be the most useful. Adolescent females and educators can benefit from viewing the Girlsmarts website, by learning how to process and educate about difficult and risky situations.

Emisha Young

Characteristics of Head Start Teaching Teams: Associations Among Classroom Quality and Child Outcomes

Project Description The study examined associations among teaching team characteristics, classroom quality, and child outcomes within a large Head Start agency. This quantitative study used 2015-16 data collected by the Early Childhood Education Institute.

Background Head Start mandates the classrooms within their program are staffed with a lead and an assistant teacher. However, the literature is scant on the effectiveness of these teaching teams and how this structure associates with classroom quality and child outcomes.

Sample The participants in the study were lead and assistant teachers and children in local Head Start classrooms in the Midwestern region. The data will include 51 lead and assistant teacher pairs and approximately 148 children at 11 Head Start sites. Participants were a part of a larger study.

Methods Through secondary data analysis, the study explored correlations among teaching team perceptions of teamwork, teacher characteristics, classroom quality and child outcomes.

Research Questions 1. What teamwork processes do teaching staff identify as factors in their success and challenges as a teaching team? 2. What level of perceived teamwork is reported by lead and assistant teachers in Head Start and do these vary by teacher role? 3. How do teaching teams’ structural characteristics associate with teamwork processes and level of perceived teamwork? 4. To what extent do teamwork processes and perceived teamwork associate with observed classroom quality? 5. To what extent do teamwork processes and perceived teamwork associate with children’s cognitive and social emotional development? Is this association mediated by classroom quality?

Findings Data analysis is underway. The preliminary findings for the first research question conclude that the challenges for teaching staff are communication and teamwork. Teachers noted that the factors that contributed to the success of their teaching teams include communication, teamwork, and interpersonal relationships. Preliminary findings for Question 2 show 80% of the teaching teams rate their level of teamwork as high and there was no difference in how lead and assistant teachers perceived the level of teamwork. Preliminary findings for Question 3 does not support any significance between years working together as team and the teams perceived level of teamwork. The poster presentation will highlight the remaining study findings.

Implications for policy/practice • Program administrators can use the information listed as successes and challenges to monitor teams to improve the team’s communication and aid the team’s tenure. • The findings can also provide insight on teaching team practices and perceptions of teamwork, which may influence the quality of the classrooms and potentially increase child outcomes.
TRAVEL TIME ESTIMATION USING BLUETOOTH TECHNOLOGY

The increase in just in time manufacturing processes and complex supply chain networks highlights the value of travel time reliability to businesses, as well as commuters and personal travel. An increasing emphasis on customer based performance metrics makes network and travel time reliability essential measures for rating transportation agency performance and determining the effectiveness of mitigating roadway congestion and transportation delays. This research presents an overview of an IoT system architecture that estimates travel time based on Bluetooth Technology In Real Time. It consists of on-ground units placed on different highway segments at the state of Oklahoma. These units detect the passing vehicles which equipped with bluetooth devices then send their data to the cloud to do travel time estimation in real time manners.

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TECHNOLOGY IDENTIFICATION IN THE 2.4 GHZ ISM BAND

With the wide range of technologies utilizing ISM (Industrial, scientific and medical) band, the coexistence between various technologies has become a critical issue, especially in the healthcare domain. This paper provides a study of applying different machine learning algorithms to identify wireless technologies (WIFI, BLUETOOTH and ZIGBEE) that utilize the ISM band in hospital environment. A training dataset has been collected in a chamber lab as a controlled environment. In order to acquire labeled data, this dataset has been used to train three different machine learning models: SVM, Decision Trees and Feed-forward Neural Network, with overall accuracy of 90%. These trained models were applied on a real dataset collected in a hospital environment.

Umair Hashmi

A GAME THEORETIC MODEL TO BALANCE THE AREA SPECTRAL EFFICIENCY -ENERGY EFFICIENCY TRADE OFF IN DENSE WIRELESS NETWORKS

We leverage a game theoretic framework to balance the gains in area spectral efficiency (ASE) and energy efficiency (EE) for a dense user-centric Cloud based random access network (C-RAN) in a multtier network. Our proposed model includes a Self Optimizing Network (SON) engine that adjusts the bias factor in the Nash bargaining solution (NBS) based on the spatio-temporal variations in the operator’s business model. Simulation results show that the optimal cluster radius fluctuates between the throughput efficient and energy efficient operating points. As an application of the results, we study the impact of NBS bias on efficiency parameters and scheduling success rate. The tradeoff analysis is presented with the aid of a simple web based application developed around the user-centric scheduling mechanism.

Azar Taufique

MOBILITY SIGNALING REDUCTION FOR FUTURE CELLULAR NETWORKS
Frequent handovers (HOs) in dense small cell deployment could lead to a dramatic increase in mobility signaling overhead. This suggests a paradigm shift towards a signaling conscious cellular architecture with intelligent mobility management. To this end, a futuristic radio access network with logical separation between control and data planes has been proposed in research community. It aims to overcome limitations of the conventional architecture by providing high data rate services under the umbrella of coverage in a dual connection mode. This approach enables signaling efficient HO signaling procedures. In this work, we investigated how much of saving in signaling reduction the proposed architecture offers compared to conventional architecture. We proposed an analytical model to quantify the signaling reduction. In addition, new parameters which can avoid excess signaling load during various mobility scenarios are proposed.

Conclusion: Our results show that signaling generated during mobility scenarios in case of conventional networks is very huge compared to CDSA architecture mobility approach. The signaling load generated during handover is depended on a number of factors for example Tp and t2 proposed parameter have a direct influence.

SOCIAL/BEHAVIORAL AND COMMUNITY SERVICE

YOUTH LEADERSHIP DEVELOPMENT THROUGH CIVIC ENGAGEMENT - A CASE STUDY

Background: Youth leadership and community engagement are associated with positive health and social outcomes. The Carrera Program at Union Public Schools identifies and recruits at-risk students to promote positive assets and academic involvement, yet the existing Carrera curricula lacks a community based leadership component. Few (30%) Carrera students surveyed regularly serve in group leadership roles or participate in neighborhood activities.

Case Description: Two Tulsa area Schweitzer Fellows implemented a pilot leadership development program among 7th grade Carrera students (n=11) adapted from the Youth Empowerment Solutions Curriculum. Curriculum components included classroom workshops (6 hours) where students were taught leadership, interviewing, problem solving, and research skills, followed by implementation of a student-identified community project (11 hours) including one interview day, two plaining workshops, and community event.

Outcomes: Students were primarily African American (60%), described their grades as mostly A’s (60%), and completed on average, 10 hours of the voluntary 17-hour curriculum. Through their crime and vandalism reduction initiative, students partnered with Tulsa Crime Stoppers to host a community-wide event attended by 100 community members, resulting in 16 new adult volunteers for their local Alert Neighbors program. Students qualitatively reported increased or improved interpersonal skills, neighborhood issue awareness, leadership ability confidence, community leader awareness, and conflict resolution skills.

Conclusion: The leadership program was well-received by participating students and the community. Future projects should identify strategies to enhance attendance and quantitatively evaluate the program using a larger sample size.
PERFORMANCE MEASUREMENT INDICATORS IN THE HEALTHCARE INDUSTRY: A SYSTEMATIC REVIEW

Objectives: This systematic review addresses a gap in the literature on performance appraisal systems for healthcare workers. Specifically, this study explores the types of employee performance measurement systems applied in healthcare services and assesses their efficiency in providing accurate measurement of the performance of healthcare workers across various job types. A particular focus is on performance indicators associated with soft skills and the delivery of quality care.

Methodology: Chochrane guidelines for performing a systematic search in discipline specific and in multidisciplinary databases was supplemented with an independent manual search of relevant studies. Screening was subjected to a pre-determined inclusion and exclusion criteria.

Findings: Twenty three articles were identified and classified into three categories: Performance measurement systems, evaluation and development of measuring tools, and problems of measuring performance of medical practitioners. The majority of studies (65.22%) are healthcare related. There appears to be no comprehensive approach to performance evaluation in healthcare. Performance measurement systems for non-medical workers is also missing. The identification of soft skills as a performance indicator was lacking despite wide empirical support for the importance of soft skills in healthcare provision. Future research should address the gaps to enhance evidence-informed decision-making in healthcare performance management.

INTERNATIONAL PLACE. EAST TULSA MULTICULTURAL DISTRICT MASTER PLAN AND URBAN REVITALIZATION

East Tulsa is the most diverse area in the city, and it’s in desperate need of order, beautification and a voice that helps its community be accepted, integrated and have access to opportunities that provide them of quality of life. Often overlooked, East Tulsa is a suburban development that has untapped resources and the potential to become a center of substantial economic development; it is also a vibrant, multicultural place in need of better conditions that facilitate meeting, interaction, celebration and exchange. With proper guidance, East Tulsa can become a touristic destination, a job source that favors the economy and an immigrant reception point that houses diversity and promotes acceptance and integration.

Due to the rising prices of living in inner cities, immigrants and diverse groups are moving to suburban environments, such as East Tulsa. The melting pot approach that tries to unify multicultural groups under the same values, language and constitutional rights is no longer valid. Heterogeneity and blending are achieved through a new process: interculturalization, which means that we are adapting elements, heritage, customs and traditions from different groups into everyday life, providing them of a local identity.

The main goal of this project is to study the potential East Tulsa has towards becoming a multicultural destination with prospective economic development; to do so, understanding the
strengths and weaknesses of the area, as well as its capability to reflect the identity of its residents, are key elements. Research, data, existing policies, site analysis, case studies, planning and urban design techniques are just some of the tools that led to the outcome of this project, a plan that follows a recommendation framework, which addresses three main issues through three goals, each of them followed by strategies and actions. The application of this plan will lead to the creation of a vision that displays what the area could be, following the wants and needs of the community and future residents of East Tulsa.

Retrofit, Connect, Interculturalize, three words that summarize the main goals of the plan, consider that through retrofitting we identify areas with potential for development along the area, and recommend specific projects, programs and partnerships that encourage opportunity creation, economic growth, densification and interaction; connect, with the objective of improving safety and prioritizing inclusion through pedestrian and cyclist accessibility, and interculturalize, as a way to facilitate contact and create a vibrant, welcoming multicultural district in Tulsa that displays the identity of its diverse community, inviting locals, visitors and future residents.

Sanaz Ebrahimi, Olivia Shadid

FOOD PHARMACY: A CASE STUDY ON EDUCATING TOMORROW’S PHYSICIANS AND A PRESCRIPTION FOR EMPOWERING TODAY’S PATIENTS. IRB: 6882

Background: Medical students’ preclinical curriculum is traditionally deficient in both interpersonal interaction with patients and coursework in the therapeutic benefits of medically-tailored foods. Further, roles typically available to preclinical students hinder the efficiency of healthcare teams. Serving as patient-provider intermediaries in a clinic utilizing a food pharmacy allows preclinical students to add value to the healthcare system. Meanwhile this experiential learning compensates for aforementioned educational deficiencies.

Objectives: Explore how serving as patient-provider intermediaries enriches preclinical curriculum by allowing medical students to: 1. Assess the prevalence of food insecurity in vulnerable patient populations. 2. Recognize the challenges faced by underserved patients and their care providers regarding medical nutrition therapy. 3. Appreciate the importance of medically-tailored foods offered through a food pharmacy to food-insecure patients.

Learning Activities: Prior to implementation of the clinic’s food pharmacy, students prepared nutrition education materials and recipe cards personalized to patient diagnoses. Over two months, medical students made weekly visits to the food pharmacy to survey patients regarding demographics and access to food, while consenting potential research participants. Students assisted the providers and research team by collecting biometric data, escorting patients to lab for monitoring, and distributing medically-tailored food “prescriptions.”

Professional Impact: Via interpersonal interactions with vulnerable patient populations and their care providers, students acquire a better understanding of the benefits of proper nutrition as well as the importance of access to medically-tailored foods. Additionally, students’ roles as patient-provider intermediaries increase efficiency of clinic activities.

Reflection: Such experiential learning allows students to add resources to health systems, meanwhile they gain valuable insights into the experience of vulnerable patients and the application of food as medicine. During clinical training, medical students’ curriculum is dictated by clinical responsibilities. Therefore preclinical students are uniquely poised to learn from patients about socioeconomic factors of health—particularly access to proper nutrition—while serving as contributing intermediaries between patients and providers.
INTRODUCTION: Intimate partner violence and sexual assault affect a wide variety of ethnic, socioeconomic, and educational backgrounds. One of the most well-established factors include peer influence and attitudes of tolerance towards violence in the adolescent population (Leen et al). Gardner et al and Foshee et al. found that individuals that participated in education such as ‘The Safe Dates Curriculum’ show increased self-esteem and a decrease in dating violence of up to 92%, when compared to those who did not receive education through those curricula. The largest impact of this education could be achieved by implementation in areas/schools that have a high number of sexual violence cases reported. The goal of this study is to understand how the demographics of domestic violence within the adolescent population is distributed through schools to better focus education for the younger generation. While it is a common assumption that education should be focused in the areas of town that are of lower economic status (in Tulsa, this would be in the Northern part of city), domestic violence affects all economic levels and we aimed to ensure that all high risk schools were identified, in an effort to educate the youth in most need. While we hope to use this work on a regional or national scale in the future, we started with Tulsa, Oklahoma as a test pilot for data collection.

METHODS: Data was obtained from CitiSource through the Tulsa Police Department after IRB approval. The source data contained de-identified records of sexual assault victims from police reports filed with the Tulsa Police department. Inclusion criteria to the data collected was 1) age at time of assault between 12 and 18 years and 2) time of assault between July 1, 2013 and June 30, 2015. A density map for the sexual assault locations was generated using a combination of CitiSource for the data, Microsoft Excel for analysis, and ESRI GIS software for the maps to identify areas where the density of reported sexual assault locations were highest. School locations were then overlaid on the density report, to identify schools that were within the high density areas for sexual assault reports.

RESULTS: There were a total of 369 sexual assault reports with victims’ ages 12-18 during the time period of July 1, 2013 and June 30, 2015 in Tulsa County (Table 1) and this included 23 schools. The schools in these areas represented four high schools, one junior high school, and 16 elementary schools within multiple parts of the city (Figure 1).

CONCLUSION: This study confirmed that areas with a high density of domestic violence and sexual assault reports were not only in the lower economic areas, but spread throughout Tulsa, OK. It also verified that these areas could be identified using a combination of computer software to compile the reports of schools to those high density areas. This data is now being used to focus intimate partner violence education towards students within these schools in Tulsa, OK. This method of identifying areas in need of increased education could be extrapolated and used within any town or city to advance educational efforts.
Fab Labs, Makerspaces and Hackerspaces are part of a decentralized global Do-It-Yourself movement providing unique resources to tinkerers, hobbyists, inventors and artists to make almost anything. Individuals who use these facilities are often called “makers.” This first of its kind research offers insight into why people intend to return to making by testing a proposed Maker Behavioral Model based on the Theory of Planned Behavior, the technology acceptance model, and creative self-efficacy. This model proposes three key characteristics which predict an individual’s intentions to continue making, namely social interactions, creative behaviors, and perceived behavioral control. A survey of the membership of Fab Lab Tulsa and other U.S.-based Fab Labs was used to test the maker behavioral model by examining the members’ attitudes and behaviors about creativity and making, technology, their social group, their openness to experience, and their creative role identity. It also examined the correlation with their intention to return to make. The results demonstrate that perceived behavioral control is the biggest predictor of maker intention, followed by creative behaviors and social interactions. Technology perceptions were related to social interactions but did not predict intention. This preliminary research has implications for any Fab Lab that seeks to bolster its membership, improve its staffing or increase facility usage. Future work should include development of the survey for non-English speakers and non-U.S. cultures.

Lydia Pearson

CHILDHOOD TRAUMA AS A DRIVER OF LOWER HOPE MEDIATED BY PTSD AND ANXIETY

It is well established in the literature that hope as an important psychological strength that drives resilience. Research also supports that post-traumatic stress (PTSD) is negatively associated with hope. Less is known, however, about the mechanisms of hope’s relationship with PTSD. Theory suggests that PTSD is an antecedent to anxiety, and that anxiety and hope are negatively associated. The negative association between anxiety and hope is based on the theory that increased anxiety is a product of increased attentional focus on anxiety producing stimuli, while hopeful thinking involves attentional focus on goal attainment, leading to positive affect and reduced anxiety. To test a directional model of the relationship between the variables based on existing theory, we executed a cross-sectional study with a sample of homeless individuals (N’ = 185) using covariance based structural equation modeling (CB-SEM). The CB-SEM model contained the of the following variables in the sequential order of: 1) Experiences of Childhood trauma; > 2) PTSD symptoms; > 3) Higher Anxiety; lending to > 4) Lower Hope.

Participants: 184 individuals who self-identified as homeless who were receiving services at a homeless outreach shelter in the South Central United States. Characteristics of the sample was an average age of 46.6 years, 54% male, 46% female, and an ethnic breakdown of 50% white, 50% minority.

Procedures: The study used a cross-sectional paper and pencil survey administered at a homeless outreach shelter. The survey sought to capture participants' experiences of childhood trauma, PTSD, anxiety, and hope. The survey was anonymous, with the study protocol being approved by the IRB of the institution with which the researchers are affiliated.

Measures: The standardized instruments used in this study were 1.) the adverse childhood experiences scale (ACE) (to capture individual differences in exposure to adult perpetrated childhood trauma); 2.) the posttraumatic stress disorder checklist; 3.) the general anxiety
disorder 7 scale to capture a respondent’s feelings of anxiety over the proceeding 2 week period; and 4.) the adult hope scale.

**Data Analysis**: Covariance based structural equation modeling (CB-SEM) with maximum likelihood estimations was used to evaluate the goodness of fit of a path model of the selected latent variables. The CB-SEM model tested for indirect effects associated with all of the model’s proposed mediators. Testing for the significance of both direct and indirect effects was done to provide empirical support for the proposed directional order of the variables.

**Results**: According to commonly accepted fit indices, the results of the CB-SEM analysis of the hypothesized model indicated the model exhibited reasonable fit ($\chi^2 = 456.06$, $p > .05$; RMSEA = .06 [90% CI: .051, .071]; CFI = .92; SRMR = .059). All of the direct effects of the model were insignificant, while all of the indirect effects were significant. Thus, the proposed model contained strictly indirect effect only types of mediation. Furthermore, the model accounted for robust variance in the dependent variables of the model: PTSD ($R^2 = .133$); anxiety ($R^2 = .554$); and hope ($R^2 = .202$). Such results provides the strongest form of support for the theorized directional model of the variables.

**Conclusions**: The directional relationship of the variables supported in this study suggest that PTSD symptoms, which involved increased attentional focus on past traumas, is positively associated with anxiety, and increased anxiety is associated with less hope. Given that anxiety and hope are negatively associated via attentional focus on anxiety inducing stimuli versus hope including stimuli, our results suggest that interventions for those experiencing PTSD may be more effective by incorporating hope building activities into therapeutic modalities. Such activities involve increasing attentional focusing on cognitive pathways to future goal attainment rather than on past trauma.

**Human Trafficking Curriculum Evaluation**

Human trafficking is a worldwide epidemic, with an estimated 2.4 million victims across the globe (International Labour Organization, 2005). Children in their teenage years are most often the target of this crime (Polaris, 2016). Therefore, a local nonprofit, Unlock Freedom, has developed and implemented a curriculum in local schools tailored to teenagers to prevent human trafficking. While the curriculum leaves the students with a variety of learned skills, perhaps the most critical targeted outcome is increases in the reporting of human trafficking.

To assist Unlock Freedom to evaluate their program, the University of Oklahoma Zarrow School of Social Work conducted a program evaluation to determine if exposure to the Unlock Freedom curriculum was associated with increases in the reporting of human trafficking. Behavioral intention theory states that the closest estimate of a specific behavior is the cognitive intent to perform that specific behavior (Shiarell et al., 2000). Since the act of reporting human trafficking cannot be deduced from a survey and can only be captured longitudinally with behavioral measures, the shortterm outcome of behavioral intention was identified via survey. The survey consisted of items designed to measure participants’ intent to report human trafficking (Shiarell et al., 2000). The survey was given using a pre- and post-design to teenage students participating in the Unlock Freedom training. In this survey, there were 58 matched pairs in this online survey from pre and post. The average age of participants was 16.5 years old. A reliability analysis confirmed the internal consistency of the intent to report human trafficking with a coefficient alpha that exceeded the accepted
threshold of >.70 for both pre- and post-tests. A paired samples t-test was then conducted to compare behavioral intention scores on the pre-survey and post-survey. There was a significant difference in the scores for the pre-survey (M=7.18, SD=2.28) and post-survey (M=8.25, SD=2.17); p-value (0.001). Results are consistent with the conclusion that the Unlock Freedom training curriculum is an effective education intervention associated with increases in participants’ intent to report human trafficking.

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WHAT PERCENTAGE OF CHILDREN EVALUATED FOR SUSPECTED ABUSE LEAD TO CRIMINAL COURT PROCEEDINGS?

**Objective:** To determine the percentage of children evaluated for suspected abuse/neglect that lead to prosecution in court and ultimately conviction.

**Design:** Retrospective case series.

**Setting:** Hospital and clinic based multidisciplinary child abuse evaluation team in Tulsa, OK.

**Patients:** Children ages 0 to 18 years evaluated for suspected abuse/neglect.

**Results:** During 2013 and 2014, 483 cases of alleged child physical abuse, sexual abuse or neglect were found to be substantiated by the Child Advocacy Center multidisciplinary team. One-third of suspected perpetrators were charged (n=151, 31.3%) and of those, 30.5% received probation (n=46) and 69.5% received jail time (n=105). Of the 322 alleged perpetrators who did not receive jail time, 19 were required to participate in treatment programs. Thirty-five alleged perpetrators were allowed DHS supervised visits with their children.

**Conclusion:** Our study demonstrates the significance of the multidisciplinary team in collaboration to recognize, respond, treat, and prevent abuse and neglect. The pediatrician, as part of the team, plays a vital role which involves more than the evaluation of a child for signs of physical trauma. It also includes collecting physical evidence and interviewing the child and caretakers, often before the involvement of law enforcement officials. Their evaluation leads to further investigation by DHS and law enforcement, resulting in the arrest of alleged perpetrators, trial proceedings and ultimately sentencing as warranted. As the child abuse and neglect (CAN) fellowship trains more physicians to become proficient in detecting child abuse, it will be imperative to monitor whether this results in the increase of conviction rates of those individuals accused of abusing our most vulnerable citizens.


**EVALUATION OF ENVIRONMENTAL AND BEHAVIORAL PRACTICES OF OVERWEIGHT AND OBESE CHILDREN SIX AND UNDER IN THE EARLY LIFESTYLE INTERVENTION CLINIC USING THE FAMILY NUTRITION AND PHYSICAL ACTIVITY SCREENING TOOL**

**Purpose:** To determine the difference in family environment and behavioral practices of overweight or obese children age 2 to 6 years enrolling in the Early Lifestyle Intervention (ELI)
Clinic, a multidisciplinary obesity program, versus two control groups in the general pediatric population.

**Methods:** Parents filled out the Family Nutrition and Physical Activity (FNPA) screening tool. Higher scores correlate with healthier environments and behaviors, with a total maximum score of 80. FNPA scores for children enrolling in the ELI clinic (n=30) were compared to two control groups recruited from the general pediatric population: one consisting of overweight and obese (ow/o) children (n=33) and one consisting of normal weight (nw) children (n=32). Data was evaluated using one-way ANOVAs.

**Results:** The overall total score between the three groups showed no statistically significant difference. The family activity involvement subscale showed a statistically significant difference between ELI clinic patients (5.67 ± 1.845) and nw patients (6.66 ± 1.459) (p = .041). For family encouragement of physical activity there was a difference between ELI Clinic (3.03 ± .928) and nw patients (3.66 ± .602) (p = .005). Two individual questions also showed statistical significance. For physical activity in free time there was a difference between ELI Clinic (2.73 ± .907) and nw patients (3.28 ± .772) (p=.036). For monitoring chips, cookies and candies there was a difference between ELI Clinic (2.37 ± .890) and nw patients (3.00 ± .916) (p = .023).

**Conclusions:** Children enrolling in ELI Clinic are less encouraged to be physically active by their family and are less physically active during free time when compared to nw patients in the general pediatric clinic. ELI Clinic patients also undergo less monitoring of their sweets intake when compared to nw children. As such, strong encouragement of healthy behavioral practices and family environments should be incorporated in the comprehensive approach to addressing childhood overweight and obesity in the future. Future studies will aim to further differentiate environment and behavioral practices between all three groups.

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EXPLORING SELECTION BIAS DUE TO INADVERTENT USE OF A RISK FACTOR FORM IN A HEPATITIS C SCREENING STUDY BY HEALTHCARE FACILITIES

**Funding:** Gilead Foundation

**Introduction:** The Cherokee Nation Health Service (CNHS) implemented a hepatitis C virus (HCV) elimination program that includes screening all CNHS users between the ages of 20 and 69 years. Previous analyses determined that there were statistically significant associations between a set of HCV risk factors, as recorded on a risk factor form (RFF), and screening; however, such bias may vary depending on where screening took place. Hence, the goal of this study was to explore if the associations previously discovered between known HCV risk factors and screening differed by healthcare facilities.

**Methods:** The data used for these analyses came from clients of the CNHS accessing one of the CN healthcare facilities during November 1, 2015-October 31, 2016. HCV risk factors were measured through a questionnaire filled-in by patients at the time of their visit. Questions on
tattooing or body art, use of intravenous drugs (IVDU), imprisonment, blood transfusion before 1992, and living with a person with HCV were asked. The screening status was determined using electronic health records. Nine healthcare facilities were examined. The cumulative incidence ratios (CIR) with corresponding 95% confidence intervals were calculated to quantify the association between risk factors and screening by healthcare facility.

**Results:** The associations between the majority of HCV risk factors and screening were not significant for most of the healthcare facilities. However, an association between imprisonment and screening, and living with a person with HCV and screening was significant for 5 of the 9 healthcare facilities. Healthcare facility 9 was unique in that the associations between HCV risk factors and screening were significant for all risk factors and had consistently stronger associations than all other facilities.

**Conclusion:** These results suggest that all but one of 9 healthcare facilities used the RFF as intended and not as a screening tool. Imprisonment and living with someone with HCV was associated with increased screening at more facilities.

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**THE EFFECT OF THREAT OF VIOLENCE ON THE TIME TO REPORT RAPE**

**Objective:** The time in which sexual assault survivors report a rape negatively influences the credibility of a case. Although sexual assault research is increasing, little is known about factors that may influence the time to report a rape. Given that prior research highlights a relationship between the threat of violence (harm to the survivor or someone else) and increased psychopathology, this study explored potential differences in time to report a rape between those who did and did not experience a threat of violence.

**Method:** Participants included 442 female rape survivors ages 18-89 (mean age=29.7, SD=10.9) who completed a Sexual Assault Nurse Examiner (SANE) exam. This exam listed whether a victim was threatened with violence during the assault. Age, time to report the rape, and threat of violence were assessed via self-report. Age was explored as a possible covariate. Independent samples t-tests were used to investigate potential between group differences in time to report a rape.

**RESULTS:** Age was not related to time to report rape ($r=0.06, p=0.214$) and not included as a covariate. Results suggest that time to report a rape was not different between females who did (mean time to report=21.4 hours, $SD=28.27$) and did not (mean time to report=23.9, $SD=27.7$) experience a threat of violence ($t(440)=0.933, p=0.351$).

**DISCUSSION:** Results provide initial evidence that factors other than threat of violence (e.g., social support) may influence the time it takes to report a sexual assault, highlighting the need for future research in this area.

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**CHEMOPROVENANCE OF THE WOODFORD AND CHATTANOOGA SHALES, OKLAHOMA**

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Upper Devonian to lower Mississippian Chattanooga and Woodford mudrocks are evaluated in terms of major and trace element concentrations to evaluate the hypothesis of a Laurentian cratonic interior provenance. An alternative provenance might include Acadian/Taconic terranes adjacent to southern midcontinent sector of southern Laurentia. In addition, chemostratigraphic correlations are being considered from exposures along the flanks of Ozark uplift to exposures in the Ardmore area, which are some 175 mi. (282 km.) apart. Samples of terrigenous mudrocks are selected from quarry exposures to minimize chemical weathering alterations.

This study uses a complete set of major elements and up to 32 trace elements and 8 REE from ICP-MS and INAA analysis; previous studies have used a more limited number of elements from XRF analysis. Total organic carbon (TOC) is compared to redox sensitive trace metals with positive correlations indicating element enrichment from marine waters and not necessarily from weathering of provenance terranes. Chemical Index of Alteration (CIA) is assessed against the paleogeographic location (20oS) with values expected for paleoclimates of this latitude, indicating local first cycle sources vs. higher values suggesting far sources of lower latitude and/or recycled sedimentary sources. Various incompatible to compatible element ratios are compared to established petrochemical sources. REE element spider diagrams, and LREE/HREE and Eu-anomaly is also consider for constraining provenance. Although research is progress at this time, it is expected that results will have significant impact on understanding Devonian-Mississippian fine textured sediment dispersal across the southern margin of Laurentia for an important petroleum unconventional resource.

57 Blackwell, John, Junran Li, Rarek Kandakji (Texas Tech University), Joe Collins (University of Texas, El Paso), Jeff Lee (Texas Tech University), and Thomas Gill (University of Texas, El Paso)

BLOWING DUST ON HIGHWAY SAFETY: CHARACTERIZING AND MODELING OF DUST EMISSION HOT SPOTS IN THE SOUTHERN PLAINS

Blowing dust and highway safety have become increasingly prevalent problems concerning human safety and welfare. Two factors precipitate wind-blown dust accidents: sudden loss of visibility, and loss of traction due to soil particles on the road surface. The project, using remote sensing and in situ measurements of surface and subsurface characteristics, will identify the location of dust emission “hotspots” and associated geomorphic features within the southwest region and panhandle (New Mexico, Texas, and Oklahoma), identify the land use associated with these hot spots, measure the volumetric moisture percentage of the potential hot spot, measure the vegetation, gap, and canopy height of vegetation to calculate the threshold shear velocity (TSV) of each potential hot spot model the results using a new software: DUSTRAN-A GIS-based Dust Dispersion Modeling System. These results will provide land managers, policy makers, and highway authorities’ critical information when making timely and informed potentially life-saving decisions and modifications. Decisions relevant in the southwest region, panhandle, and potentially world, wherever blowing dust is a hazard to highway safety.

58 Chowdhurry, Shuddha and Sharmin Jahan
SMART PRICE TAG AND SMART RACK MANAGEMENT SYSTEM FOR FUTURE CONVENIENCE STORE
The Internet of Things (IoT) presents an enormous amount of opportunity for retailers to develop a vastly improved ecosystem that connects physical and digital worlds, allowing bidirectional, real-time interaction with consumers both inside and outside of the store. Future convenient stores will be smart, intelligent and it will improve customer experience in various ways. Not only it will save valuable time for the users, but it will also significantly improve user experience too. Since the number of IOT connected devices is increasing at an alarming rate, we want to develop low-cost but efficient and intelligent IOT systems which we can easily integrate into the real world. Current price tags which are attached and displayed with the products are static, and they do not keep track with the real-time supply and demand. They do not perform analysis of users’ behavior and make decisions based on users’ previous purchases. Our Smart Rack Management System will notify the retailers when the rack is empty so that retailers can fill the rack immediately. In the future, these types of smart price tags and smart rack system will be ubiquitous in convenience and retail stores to significantly improve a user’s purchasing experience and in-store experience. Smart price tags will provide discounts to customers and motivate them to buy more products. Additionally, it will update the price in real time so that real-time market data can be used to calculate the latest price.

59  Coleman, Jonathan, Jesse Issaacs-Boyett, Brady Mayfield, and Nathan Reisner

THE EFFECT OF SUGAR-FREE ENERGY DRINK ON ADOLESCENT PAIN INDUCED BY AN ISCHEMIC METHOD

Energy drinks are consumed with the intent of improving performance at increasing rates. Current literature shows mixed results for the effect of energy drinks on subject pain tolerance. Energy drinks effect on youth is not well researched. Twelve to fifteen year olds were tested. Using a double blind study, subjects were administered a sugar-free energy drink (3 mg caffeine/kg body mass) or a placebo (equal volume). Subjects had eight hours of sleep, no food for eight hours, and no caffeine for twelve hours prior to testing. Sixty minutes after the treatment, muscle fatigue was induced with fifty percent of maximum effort for two minutes using a dynamometer. Fresh oxygen was prevented from reaching the forearm by applying a blood pressure cuff to the upper arm during pain assessment. A self-assessed six-point linear pain intensity scale was used to determine pain level. The subject identified the pain level every thirty seconds for two minutes following the inflation of the cuff. Results were analyzed using the within-subjects t-test method.

60  Corley, Ryan

NMFTA CAN LOGGERS

Currently we have a grant with The National Motor Freight Traffic Association to design and produce 100 low cost CAN loggers. We have designed a simple compact device and each will record data from semi-trucks around the country. The goal of this project is to create a database of typical driving data for heavy trucks. In the future we can use this data to develop a system to scan for anomalies that could be malicious attacks on a heavy truck’s CAN network. While being responsible for every step of designing the hardware and software, this project has offered numerous educational opportunities. These devices are fully capable of logging at 100% busload, with a maximum data capacity of nearly 32GB. Each device has been through a strenuous quality
control project as they under no circumstance can affect the productivity of the truck that each unit is installed on. These devices are truly a step in the right direction towards understanding and learning about how each of the on board computers interacts with those around them, and offer potential insight into how to properly care for a mobile network such as the Heavy Truck’s CAN network.

61 Brian Diehl

SEQUENCE STRATIGRAPHIC RELATIONS OF THE FREDERICKSBURG AND WASHITA GROUPS, LOWER CRETACEOUS CARBONATE SHELF, TEXAS

Stratigraphic interpretations of the Lower Cretaceous – c. 108-97 Ma – Fredericksburg and Washita groups on the Comanche carbonate shelf have been debated for many years. Applications of sequence stratigraphy provide an accurate method for predicting the thickness, quality, and distribution of reservoir rocks in the Fredericksburg Group. This research addresses several ongoing questions regarding carbonate sequence stratigraphy of the Fredericksburg and Washita groups and tests current stratigraphic models. The sequence boundary between the Fredericksburg and Washita groups, Albian Sequence Boundary Washita 1 (AL SB WA1), is an iron-stained, bored hardground in north Texas, and southeast Oklahoma. In the Western Interior the contact records the flooding of the North American Continent. However, southward on the San Marcos Arch near Austin, Texas, the contact has been traced at the base of the Person Formation by several published stratigraphic models. This study documents the origin of the Fredericksburg-Washita sequence boundary and tests correlations of carbonate depositional cycles. To accomplish the objectives, petrographic, isotope, and X-Ray Diffractometry data of core and outcrop sections were gathered. Results support a sequence stratigraphic interpretation that traces the Fredericksburg-Washita contact from north Texas (between the Kiamichi and Goodland formations) to south-central Texas (between the Person and Georgetown formations) as a continuous, unconformable surface.

62 Carr, Jessie Goolsbay

ANIMAL-ASSISTED THERAPY: KNOWLEDGE, ATTITUDES, BELIEFS, AND PRACTICE PATTERNS OF SPEECH-LANGUAGE PATHOLOGISTS

Background: Animal-assisted therapy (AAT) is the use of an animal as a therapy tool by a health professional to help clients reach their goals. Purpose: The purpose of this study is to assess the knowledge, attitudes, beliefs, and practice patterns of speech-language pathologists in Oklahoma regarding AAT. Methods: I conducted an electronic survey of speech-language pathologists at the 2016 Oklahoma Speech-Language-Hearing Association conference. The survey consisted of three sections: demographics, knowledge, and attitudes and beliefs. The demographics section assessed education, clinical experience, practice patterns, and AAT use. The knowledge section consisted of thirteen true and false questions about the basic concepts of AAT. The attitudes and beliefs section consisted of eighteen Likert-scale questions and four multiple-choice questions that assessed participant perceptions of AAT. Results: Of the 79 that completed the survey, 97% believe that at least some of their clients could benefit from AAT, but only 20% of respondents have used AAT. On average, respondents answered 80% of the knowledge questions correctly and indicated positive perceptions of AAT in 69% of responses.
Attitude toward AAT is the only factor related to AAT use. Conclusions: The results of this survey show that despite limited implementation, speech-language pathologists in Oklahoma have a good understanding of AAT and generally positive attitudes toward its use with clients with communication disorders. Results from this survey parallel the survey of occupational therapists performed by Hightower (2010). This could suggest a trend across rehab professionals’ knowledge, attitudes, beliefs, and practice patterns, including barriers to AAT implementation.

Johnson, Avery

TRACE ELEMENT TESTS OF LAVA RELATEDNESS FOR THE CRETACEOUS ONTONG JAVA PLATEAU

The Ontong Java Plateau is a large, submarine outpouring of basalt situated in the equatorial western Pacific Ocean. The plateau, Earth’s largest igneous province, covers about $2.0 \times 10^6$ km$^2$ and is covered with 200 to 1400 meters of sediment. It was formed rather rapidly, with the main emplacement of lava being about 120 million years ago. The Ocean Drilling Program (ODP) has made 10 drill holes to study the area. Remarkably, fresh basalt glass is preserved in most holes and provides excellent material for precise analysis of lava compositions. Published geochemical data from whole rocks from these holes indicate that the basaltic chemistry is fairly similar across the plateau. Geochemical similarity could indicate derivation of widely separated lavas from the same eruption (most related) to simply being from a similar mantle source (least related). In this study, I use trace element compositions of natural basalt glasses (which are much more precise than whole rock analyses), measured by laser ablation inductively coupled plasma mass spectrometry (LA-ICPMS), to test the relatedness of lavas from widely separated drill holes. Elements such as barium, niobium, and the rare earth elements and their ratios do not change with fractional crystallization, but are highly characteristic of mantle source composition. Therefore, these elements are used to determine whether lavas from separate drill holes came from the same eruption, or the same magma chamber, or represent melts of different mantle sources. For lavas that can be related by fractional crystallization, trace elements such as nickel and chromium that partition strongly into crystal phases are used to determine how much fractional crystallization occurred. Data will be presented to compare and determine potential relationships of lavas from different holes.

Kernen, Julianne

THE IMPACT OF DISFLUENCIES ON LISTENER RECALL AND COMPREHENSION: A SYSTEMATIC REVIEW

Disfluencies have inherent characteristics that might cause a disruption in listener recall and comprehension. These characteristics suggest that disfluencies are hurtful, or a disadvantage, to comprehension and recall; however, the predictive processing hypothesis, attentional-orienting hypothesis, and the temporal delay hypothesis suggest otherwise. These hypotheses suggest that disfluencies may be helpful to listeners. The purpose of this study is to determine how disfluencies in speech affect listener recall and comprehension. A systematic search was conducted using five databases, designated search terms, and set inclusion and exclusion criteria. The search yielded 423 total articles. After removal of duplicates, a title review, and a full text review with two reviewers, the search yielded 11 total articles with a moderate agreement value ($k=0.55$). The studies included were either randomized control studies or
repeated measure designs. Six studies focused on comprehension, one focused on recall, and four focused on both skills. Results were analyzed for stuttering-like and non-stuttering-like disfluencies based on the assessment methods used. The disfluencies addressed in this study include: interjections, silent pauses, prolongations, repetitions, and revisions. Findings suggest that disfluencies in most sentence structures have no effect on listener comprehension. However, recall skills of listeners are improved in the presence of silent pauses and interjections while repetitions and non-linguistic interjections hinder listener recall. Results do not reveal a specific cause for the disfluency advantage, but evidence suggests that the advantage may be due to the extra time, predictive features, or attention orienting characteristics associated with disfluencies.

Khattab, Raneem

INSULIN EFFECTS ON CELL METABOLISM IN CELLS LACKING THE TUMOR SUPPRESSOR P27KIP1

A novel role was recently identified for the tumor suppressor p27kip1 (p27) in cancer cell metabolism. Previous work used cells lacking p27 to show that its deregulation allows cancer cells to switch to amino acids as a carbon source when glucose levels are low. Because insulin is a well-known regulator of glucose metabolism, our goal was to evaluate insulin effects on cells with and without p27. We varied cell nutrients (i.e., their carbon source) in the presence of different insulin concentrations. Effects on cell metabolism were determined by measuring ATP levels using CellTiterGlo™, a luciferase-based assay in which ATP levels correlate with light produced and measured using a luminometer. Metabolic pathways being utilized were identified using the metabolic inhibitors 2-deoxy-glucose (which inhibits glycolysis) and rotenone (which inhibits the electron transport chain). Consistent with previous results suggesting the absence of p27 alters cell metabolism, we found that cells lacking p27 respond differently to insulin stimulation.

Loe, Elisabeth

SUGAR METABOLISM IN CELLS LACKING THE TUMOR SUPPRESSOR P27KIP1

Cancer cells display altered metabolic pathways to maintain sufficient ATP production while conserving carbon for the biomass production needed for cell proliferation (Warburg effect). We have investigated this phenomenon in mouse fibroblast cells with and without the tumor suppressor gene p27kip1, which is commonly deregulated in aggressive human cancers. Cells with and without p27kip1 were cultivated in a base minimal media lacking all carbon sources. Various sugars such as glucose, galactose, lactose, sucrose, and fructose were then added, and the effects on ATP production and viability were evaluated. Cell viability was measured using a resazurin-based fluorescent assay in which living cells convert resazurin to the fluorescent resorufin, which can be measured using a plate reader. The rate of cell metabolism (as indicated by ATP levels) was determined using the Cell Titer-Glo assay™, a luciferase-based assay in which ATP levels correlate with light output. The amount of light emitted was measured using a luminometer. Results indicate that glucose is the preferred carbon source for ATP production in both cell types. The metabolic inhibitors 2-deoxyglucose and rotenone were employed to identify the metabolic pathways being utilized.
THE VALIDITY OF THE ROAD SIGN PERCEPTION TEST

Effort, the measurement of an individual’s investment in performing a given task compared to the individual’s natural performance, is widely applicable in the fields of criminal justice, psychological assessment, and medical diagnostics. Suboptimal effort or deceptive effort can tarnish the results and interpretation of a test administration. The Medical Symptom Validity Test is widely accepted as a gold standard instrument for suboptimal effort detection. A new test, the Road Sign Perception Test, could be an important contribution to the field of neuropsychology and, possibly, effort testing. The RSPT is a speeded visual perception test with variable times for presentation of visual road sign stimuli. The present study used an undergraduate sample screened for treated psychological or psychiatric disorders, treated medical conditions, substance dependence or abuse that was not in remission for the past 6 months, and experience with electroconvulsive therapy. They were administered the RSPT as well as the MSVT. Performance on this new test (RSPT) was correlated MSVT. All participants obtained near perfect or perfect scores on the MSVT indicating good effort. Thus, given this lack of variability of scores, no significant positive correlations were found between the MSVT and the RSPT scales and subscales. A significant negative correlation was found between Delayed Recognition subtest on the MSVT and the Easy Item sub-score on the RSPT, but not with the Hard Item sub-score. The RSPT Easy and Hard Items means scores differed significantly, which could inform patterns for detection of suboptimal effort in future studies. Additional data are provided on the RSPT in a healthy undergraduate sample for possible comparisons with future studies. Limitations of the current study and future directions for examining variability in effort are discussed.

DIAGNOSTIC, CONSTRUCT, AND ECOLOGICAL VALIDITY OF THE VERBAL CONCEPT ATTAINMENT TEST IN MULTIPLE SCLEROSIS

Objective: As many as 65% of people with multiple sclerosis (MS) have clinically significant cognitive impairment, and most of these people demonstrate executive dysfunction. Most research concerning executive dysfunction in MS has focused upon measures that ignore speed of information processing or psychomotor responses. Rather, most MS-related research has focused upon measures such as the Wisconsin Card Sorting Test (WCST), an index without speed demands. Nonetheless, the WCST focuses upon non-verbal concept formation to the exclusion of verbal conceptual reasoning. The Verbal Concept Attainment Task (VCAT: Bornstein & Leason, 1985) has demonstrated construct validity as an executive function measure in people infected with HIV and in people with focal brain lesions, but its validity among people with MS is unknown. The current study evaluated the VCAT’s diagnostic and construct validity in people with MS.

Participants and Methods: A comprehensive neuropsychological battery was administered to a total of 30 healthy individuals and 117 people with MS. Based on existing norms, they were classified as impaired or unimpaired, resulting in 21 people with MS categorized as impaired and 96 MS patients and 30 healthy people as unimpaired.
**Results:** VCAT scores were used to predict impairment in a receiver operating classification (ROC) analyses which captured 83% of the area under the curve. The optimal cut score of 18 on the VCAT yielded 77% sensitivity, 76% specificity, classification accuracy of 76%, a Youden Index of .52, positive predictive power of 36% and negative predictive power of 95%. This cut score fell at the 5th%ile of the healthy group. Regarding construct validity, the VCAT significantly correlated with the Wechsler Test of Adult Reading Standard Score \((r=.357, p<.0005)\), Digit Span Age Corrected Scaled Score \((r=.241, p=.005)\), WCST Percent Perseverative errors \((r=-.309, p<.0005)\) and Percent Conceptual Level Response, \((r=.368, p<.0005)\), Boston Naming Test \((r=.362, p<.0005)\), California Verbal Learning Test-2 Total Recall \((r=.367, p<.005)\), Paced Auditory Serial Addition Task Total Correct \((r=.281, p=.001)\), DKEFS Category Switching Total Switching Accuracy Scaled Score \((r=.229, p=.007)\), Multilingual Aphasia Examination Token Test Total Raw Score \((r=.174, p=.042)\), Symbol Digit Modalities Test Oral total correct \((r=.288, p=.001)\), Verbal Fluency Total Correct Raw \((r=.331, p<.0005)\), and it failed to correlate significantly with measures of sensory or motor function. The VCAT showed marginal correlations with the Chicago Multiscale Depression Inventory (CMDI) total score \((r=-.174, p=.029)\). However, the VCAT achieved correlations with self-report measures of cognitive dysfunction (Mental Health Inventory, Perceived Deficits Questionnaire) and functional outcomes (Environmental Status Scale, Incapacity Status Scale, SF-36) that generally exceeded the other measures in the neuropsychological battery (all \(p's<.001\)).

**Conclusions:** The data establish an optimal VCAT cutoff score for establishing neuropsychological impairment in people with MS. They further demonstrate that the VCAT possesses effective diagnostic and construct validity. Compared to other neuropsychological measures, the VCAT corresponded most highly with measures of functional outcomes and disability, implying that it possesses keen ecological validity. As such, these data argue for the inclusion of the VCAT in research and clinical practice involving people with MS.

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**Parackal, Julia and Sheaff Robert**

**SPECIFICALLY TARGETING CELLS LACKING THE TUMOR SURPRESSOR P27KIP1 USING METABOLIC INHIBITORS**

P27 is a well-known cell cycle inhibitor that is deregulated in many types of aggressive cancers. Most tumor suppressor proteins are mutated at the gene level. However, p27 is deregulated at the protein level, making it a viable target for therapeutic intervention. Recent evidence suggests a novel role for p27 in metabolism. Using cells with and without p27, it was found that the absence of p27 allowed cells to switch to glutamine as a carbon source under low glucose conditions. It was hypothesized that this ability would provide a growth advantage during early tumor development when glucose is scarce. To confirm this hypothesis, the effects of metabolic inhibitors on cancer cell metabolism (ATP levels) will be evaluated and compared to the results to a control cell line lacking the p27 protein. 2-deoxy-glucose, (2DG), an analogue of glucose, was used to mimic low glucose conditions, while rotenone was used to inhibit the electron transport chain. ATP levels were measured using a luciferase-based assay (Cell-Titer GloTM). This assay lysis the cells and generates luminescence proportional to the ATP concentration, which can be measured with a photoluminometer (Glomax). Results indicate that cells containing p27 are very sensitive to 2DG, consistent with dependence on glycolysis. In contrast, cells lacking p27 were relatively insensitive to 2DG, suggesting they were able to switch to alternative carbon sources.
like glutamine. This hypothesis was confirmed by showing that in the presence of 2DG, cells lacking p27 become very sensitive to rotenone.

70 Peelen, Avery

THE EFFECT OF READING INSTRUCTION ON READING OUTCOMES IN DEAF AND HARD OF HEARING STUDENTS: A SYSTEMATIC REVIEW

Most profoundly deaf children lag significantly behind their hearing peers in reading development, and little research has been done to develop evidence-based practices for the deaf population. The purpose of this study was to determine how phonic skill-based approaches versus whole language approaches to reading instruction affect reading outcomes in elementary school students who are deaf and hard of hearing. I conducted a search of the literature for empirical evidence using a predetermined set of search terms in multiple databases. I removed duplicates and screened titles, and then I reviewed abstracts. Finally, two reviewers independently evaluated the full-text articles based on the eligibility criteria. All the studies included for synthesis were phonic or direct instruction approaches to reading instruction. No studies on the effects of whole language met eligibility criteria. All included studies showed positive effects on one or multiple reading outcomes. The reading outcomes represented were phonemic awareness, phonological decoding, reading fluency, and comprehension. Based on the information found in this systematic review, using a phonic approach to reading instruction with students who are deaf and hard of hearing could be appropriate. However, because no studies assessing the effects of whole language approaches met eligibility criteria and no studies compared phonic approaches to whole language approaches, it cannot be concluded that phonic approaches are more effective with deaf and hard of hearing students than whole language approaches.

71 Pohl, Kenneth A., Purser, Gordon H., and Sheaff, Robert J.

SUNSCREEN CHLORINATION ALTERS ITS ABSORPTIVE PROPERTIES

Chemical sunscreens are commonly used to protect skin by reflecting or absorbing harmful ultraviolet radiation. Properties of the active ingredients, however, can be altered by chemical interaction with molecules in the environment. Previous research indicated that sunscreen active ingredients can react with chlorine under conditions similar to those found in swimming pools, which could influence their protective capabilities. Various commercial sunscreens were therefore allowed to react with hypochlorous acid followed by analysis of UV absorption using a UV/Vis spectrophotometer. While in most cases chlorination compromised UV absorption, one sample actually showed enhanced activity. This sample contained 1.0% avobenzone, 8.0% octocrylene and 3.5% oxybenzone. Current efforts are focused on chlorinating the individual active ingredients and determining which modified species leads to better UV absorption.

72 Porter, Allison

MIDDLE-UPPER ALBIAN SAN MARCOS PLATFORM SEQUENCE STRATIGRAPHY, EDWARDS AND WASHITA GROUPS, TEXAS
The controversy about the position and origin of the sequence stratigraphic contact between the older Fredericksburg and younger Washita groups on the Lower Cretaceous Texas Comanche Shelf and San Marcos Platform is clarified by new petrographic, biostratigraphic, and geochemical analyses. Previous studies proposed facies change between the Washita and Fredericksburg groups based on lithologic changes in both core and outcrop. However, new fossil records and geochemistry indicate that the contact is unconformable. Rudist, coral, calcareous algae, and other shallow marine fossils increase in abundance and fragment size upwards through the shoaling up Person Formation. The overlying Georgetown Formation contains glauconite, indicating slow deposition, broken up grains of various deeper shelf mollusks, planktic foraminifers, and echinoderms, which indicate flooding and drowning of the older Person rather than a facies relationship. In addition, in outcrop, a set of three iron-stained bored surfaces lead up to the Person/Georgetown contact. Geochemical isotopic data directly below the contact indicate subaerial exposure of Person formation top based on the extremely negative nature of the Carbon isotopes. Similar isotopic signatures are at the major Fredericksburg-Washita contact in the nearby Selma core. After careful sampling of the Stone Crossing outcrop and Selma core, thin section petrography, biostratigraphy, and carbon and oxygen data indicate subaerial exposure of top Person and abrupt change in carbonate facies at the Fredericksburg-Washita contact. Therefore, the Fredericksburg-Washita contact is a major sequence boundary and not a facies change.

Rowe, Allyson, O. John-Paul, John C. DiCesare, and Robert J. Sheaff

CYTOTOXICITY OF NOVEL NAPHTHOQUINONES

The previously synthesized napthoquinone abduct 12,13-Dihydro-N-methyl-6,11,13-trioxo-5H-benzo[4,5]cyclohepta[1,2-b]naphthalen-5,12-imine (known as TU100) showed promise as a potential chemotherapeutic agent. Four new derivatives with unique structure and functional groups have been generated to further characterize biological activity and enhance therapeutic potential of TU100. Cellular cytotoxicity was evaluated by incubating different concentrations of the compounds with various mammalian cell lines, then measuring cell viability using a resazurin-based fluorescent assay. As expected, altering TU100 functional groups had significant effects on induction of cell death. To further characterize these differences, the time dependency of compound cytotoxicity and their effects on cell morphology was evaluated. An analysis of compound effects on ATP production suggested that altering TU100 functional groups altered their biological targets, which may explain the differences in cellular cytotoxicity.

Rubino, Mariah, Chelsea M. Cogan, Rachel L. Micol, & Joanne L. Davis

DOES VICTIM AGE IMPACT TIME TO REPORT RAPE?

On average, more than 320,000 Americans become victims of rape every year. Victims come from every age group, race, and socioeconomic background, and how long a victim takes to report their rape to law enforcement can vary widely. While research has examined the demographics of rape survivors, little is known about potential causes of taking a longer time to report a rape, such as the age of the victim. This is an important area to examine due to different barriers individuals at different ages may experience when trying to report. Victims who take longer to report their assault often face increased skepticism from legal officials. The Time to
Report Rape in a Community Sample study has collected data from roughly 1000 reports of rape from 2008 to 2012 in Tulsa. For the purposes of the present study, only individuals who reported their assaults and had both assault and exam time listed were included in the analyses ($n = 722$). Victim ages were examined both on a continuum ($M = 26.35$, $SD = 11.91$) and separated into four groups. Preliminary evidence suggests that age (either grouped or on a continuum) of the rape victim does not impact the time to report rape. The reasons the age of the survivor may not impact how long it takes to report will be explored in greater detail in the presentation. These findings demonstrate that individuals of all ages are reporting these incidents, even if he/she takes longer to report the assault.

75 Sosa, Jordan D.

**DESIGNING AND CONSTRUCTING A MULTI-FUNCTIONAL POLARIZED MICROSCOPE**

There is a recent interest in crystalline materials with ferroic properties because they may allow for more efficient data storage or solar energy harvesting. However, many of these materials are birefringent and have properties only viewable on the nanoscale, so a very specified microscope is needed to see through the birefringent effect, and apply Kerr microscopy to see magnetic or electric polarization, as well as see with high resolution and magnification. Kohler illumination was used to achieve resolution down to hundreds of nanometers. To see into even birefringent materials, meaning light moves differently depending on the light orientation, polarized microscopy became a part of the microscope, using polarizers and waveplates. The Kerr microscopy will be achieved through viewing the material in varied temperatures, pressure, magnetic fields, applied currents, or applying a photovoltaic effect. Pump-probe microscopy will also be used to measure reflective properties of these materials. In the future, this microscope will help find a possible way to manipulate the electric or magnetic polarizations (the ferroic properties) or possibly domain walls that form from crystalline properties. These materials are interesting because they are metals, but polarize under certain conditions which this microscope will explore.

76 Spencer, Rachel

**A SYSTEMATIC REVIEW OF VOCABULARY INSTRUCTION TECHNIQUES FOR SCHOOL-AGE CHILDREN WITH COMPARISON TO CURRENT PRACTICES FOR DUAL-LANGUAGE LEARNERS IN CARTAGO, COSTA RICA**

The purpose of this paper is: (1) to determine what evidence-based techniques exist for vocabulary instruction in school-aged children and (2) to analyze how evidence-based techniques for vocabulary instruction are implemented in third and sixth grade English classrooms in a dual-language school in Cartago, Costa Rica. A systematic review of the literature to identify evidence-based techniques for vocabulary instruction in L1 and L2 of English was conducted to create a comprehensive list of strategies with empirical support. A qualitative study was then conducted of vocabulary instruction in a Spanish speaking school within a Spanish-speaking country with explicit English vocabulary instruction. Information was collected through observation of English grammar and oral English classrooms, collection of questionnaires completed by English-speaking teachers in the school, and collection of artifacts in Cartago, Costa Rica. This information was analyzed in light of the compiled list of evidence-based techniques for vocabulary instruction to gain a better understanding of vocabulary
instruction in Costa Rica. The implications of this study are significant in multiple disciplines. Educators and speech pathologists can reference the comprehensive list of evidence-based vocabulary intervention techniques to guide their clinical practice. Professionals can apply these interventions when they work with all school-aged children. Furthermore, this study allows professionals to have a better understanding of how Dual Language Learners learn English in a Spanish-speaking environment.

Stokes, Makenzie

**HOW CAN INTERVENTIONS BE USED TO ADDRESS FACTORS ASSOCIATED WITH RECIDIVISM AND REINCARCERATION RATES WITHIN THE CURRENTLY OR PREVIOUSLY INCARCERATED ADULT TBI POPULATION**

Within the US prison population there are approximately 25-80% of incarcerated individuals at any given time who report having experienced at least one traumatic brain injury (TBI) event within their lifetime. Considering this large percentage of these individuals as well as the potentially long-term deficits that can result from a TBI, the need for interest in interventions to address this subset of the prison population would likely contribute to the overall reduction in the increasingly high recidivism and reincarceration rates in the US.

Because of the general lack of evidence associated with the subset of the prison population that suffer from TBI-related symptoms/deficits, it is not possible to make conclusive statements about the types of programs and how they can affect the larger prison population or the recidivism and reincarceration rates in the US. Nonetheless, there was some evidence to support the effectiveness of programs that shed any therapeutic light on the large percentage of individuals within the prison population that have TBI-related symptoms/deficits. There is a need for future research in order to address the reduction of the general prison population as well as recidivism and reincarceration rates.

Sullivan, Sarah, Dr. Robert Sheaff, and Raneem Khattab

**TARGETING CELLS LACKING THE P27KIP1 TUMOR SUPPRESSOR USING METFORMIN**

Previous work has shown that cells lacking the tumor suppressing protein P27kip1 are able to switch to amino acids as a carbon source when glucose levels are low, and that a combination of rotenone, an electron transport chain inhibitor, and 2-deoxy-glucose, a glycolysis inhibitor, produces a synergistic effect in the cells without P27kip1. However Rotenone is toxic to humans and cannot be used in clinical settings, so we are exploring the use of metformin as an alternative treatment. Metformin has shown electron transport chain inhibition, and previous studies has indicated that metformin inhibits the electron transport chain at the same point as rotenone. We used the commercial assays CellTiter Glo and CellTiter Blue, to measure the effects of various rotenone and metformin concentrations on cell lines with and without P27kip1. We hope to use this information to develop a combination drug treatment that can differentially target tumor cells with downregulated P27.

Tan, Xiao and Robert W. Scott
ISOTOPE CHEMOSTRATIGRAPHY OF THE MIDDLE ALBIAN REGIONAL DENSE MEMBER, EDWARDS GROUP, SAN MARCOS PLATFORM, SOUTH-CENTRAL TEXAS

The Lower Cretaceous Edwards Group in Central Texas on the San Marcos Arch is the main aquifer of the region. In the subsurface, it also is an important hydrocarbon reservoir. The Edwards Group is divided into two limestone intervals by a marly limestone called the Regional Dense member (RDM). The RDM is a thin, widely traceable, argillaceous and bioturbated limestone that is readily recognized from well logs. Accurate correlation of the RDM determines reservoir geometry and areal extent. Two correlation hypotheses prevailed. The RDM is correlated with an algal boundstone in the subsurface Stuart City Limestone, which makes the RDM the same age as the middle Albian Fredericksburg Group (Waite et al, 2007). In contrast, Rose (1972) correlated the RDM with the upper Albian Kiamichi Formation Washita Group. A detailed study of the Regional Dense member tests both interpretations by means of biostratigraphy and chemostratigraphy. X-Ray Diffraction analysis characterizes the mineralogy of RDM. Stable isotope analyses of δ13C and δ18O tests two possible origins of the contacts of the RDM as subaerial or submarine. Updip across the Balcones Fault system, The Fredericksburg Group correlates with the Edwards Group. A Fredericksburg flooding contact will be tested in order to correlate it with the RDM. If the Fredericksburg contact correlates with the base of the RDM, then both groups are part of the same long-term cycle. But if the Fredericksburg contact is older than the RDM as previously proposed, then both groups are composed of two long-term cycles.

Tecle, Leah and Heather Hayes

CULTURAL DIFFERENCES IN PERSONALITY PROFILES: IMPLICATIONS OF RELATIONALISM IN ORGANIZATIONS

In the current study, cultural differences in socially-relevant personality profiles were explored by further differentiating countries within the well-established individualist-collectivist dichotomy to include a relationalism component – namely, the hierarchical nature of relationships, emotional expressiveness, and interpersonal sensitivity. Implications for organizations, such as leadership and interpersonal transactions across cultures, are discussed.

Trewitt, Jordan

RFID TESTBEDS TO STIMULATE GROUND LIKE CONDITIONS

In order to evaluate the viability of Radio Frequency Identification (RFID) technology installed on buried pipes, a test bed for rapid testing and development of RFID antennas and systems needs to be created. Within the underground signals fields, researchers bury the sensors and antennas, which can be messy, time consuming and is harder to isolate in RF free environments.

Therefore an alternative is proposed with loaded dielectric foam blocks. These blocks can then be configured to simulate ground like conditions. Varying volume percentages of TiO2 within these foam blocks vary the dielectric constant linearly. In order to verify the dielectric constant and losses from the TiO2, a probe resonates at varying frequencies according to effective dielectric constants.
To further develop the test bed, a software defined radio (SDR) and power amplifiers connected to wideband and directional antennas are then installed in conjunction with the dielectric foam blocks to evaluate RFID and ground penetrating radar (GPR) over a wide range of frequencies and pulse signatures. To check on radar profiles and power requirements, RFID antennas and pipes are installed between layers of the dielectric blocks. RFID antennas in these types of dielectric environments need to have high enough bandwidths because of the varying soil conditions. Because the soil dissipates power quickly, these antennas need to have a large enough aperture sizes and gains. These antennas are matched to RFID integrated chips (ICs) in order to reduce power losses that can hinder power up operation of the IC.

Westbrook, Julia

COMPARATIVE EUROPEAN ASYLUM POLICIES IN LIGHT OF THE RECENT INFLUX OF SYRIAN REFUGEES

This project attempts to identify the societal or cultural factors that lead to a country’s strict or open asylum policy. My research asks the question, “why are some countries more or less tolerant of refugees?” This topic has proved to be critical in the recent and upcoming worldwide elections. I have narrowed my focus to two case studies: the welfare state of Denmark and Germany with the “open door” policy. My project remains in progress as I synthesize and analyze the qualitative data that I collected last semester. I have interviewed ten individuals representing several NGOs and nonprofits, government agencies and specialized law practices in both Denmark and Germany to serve as data for analysis. While the project is still underway, it is becoming evident that varying degrees of xenophobia, religious ideals, Islamophobia, fear in general, as well as a broad range of cultural norms and values and a country’s cultural and military history play integral roles on the society’s influence of their respective asylum policy. The role of the church as well as the role of the media also make a difference. The data I have gathered reveals a clear connection between a society’s overall tolerance and acceptance for those who are different and their levels of restrictions and limits in asylum policies. To gain a more personal understanding of the asylum and integration processes in my own community, I have volunteered with the YWCA Office of Immigrants & Refugees throughout the course of this project.