University of Oklahoma – Tulsa

Research Forum 2019

Book of Abstracts

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OU-Tulsa Student Government Association

Dear colleagues,

It is my pleasure to share with you the abstract book for OU-Tulsa's 2019 Research Forum. The OU-Tulsa Research Forum is an annual event to showcase student and resident research.

Welcome to all of you that are joining us for the first time and to those who have been long-time supporters of Research Forum. We hope members of the research community and the greater Tulsa community enjoy hearing about the diverse research projects presented today. This book contains the abstracts of accepted posters to the OU-Tulsa 2019 Research Forum.

We would like to express our thanks to the OU-Tulsa Student Government Association for their generous support, and the School of Community Medicine's Office for Research Development and Scholarly Activity for their dedicated commitment in planning and organizing the OU-Tulsa 2019 Research Forum.

On behalf of the OU-Tulsa 2019 Research Forum Program Committee, we look forward to seeing your research on display. Thank you in advance for your commitment to sharing your research in the Tulsa community.

Sincerely,

Kent Teague, PhD OU-Tulsa 2019 Research Forum Chair

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Biomedical

Abstract #16: MICROBIAL BILE ACID DECONJUGATION AND IMPAIRED UPTAKE IN PREGNANCY REPRESS SYNTHESIS REGULATION

Ms. Natalie Santa-Pinter - OU-Tulsa
Dr. Caroline Ovadia - King's College London
Prof. Catherine Williamson - King's College London

Background: Pregnancy is associated with progressive hypercholanemia, hypercholesterolemia and hypertriglyceridemia, which can result in metabolic disease in susceptible women. Gut signals modify hepatic homeostatic pathways, linking intestinal content to metabolic activity. In this study, we sought to determine whether gestational alterations in the human gut microbiota and intestinal metabonome could contribute to raised serum bile acids observed in human pregnancy through interaction with FXR-mediated enterohepatic signaling.

Methods: Most of the work for this study was conducted at King's College London.

Human serum samples were obtained from 14 non-pregnant women (with previously uncomplicated pregnancies) and 24 women with uncomplicated pregnancies. Fibroblast growth factor (FGF)19/15 protein and mRNA levels, and 7α-hydroxy-4-cholesten-3-one (ie. C4, a bile acid intermediate, produced by CYP7A1) were measured.

Human terminal ileal biopsies were obtained from non-pregnant individuals undergoing routine colonoscopy. Human and murine terminal ileal farnesoid X receptor (FXR)-mediated gene expression and apical sodium bile acid transporter (ASBT) protein concentration were measured by qPCR and western blotting.

Human fecal samples were obtained from 14 women with uncomplicated pregnancies and 9 non-pregnant healthy women. Murine ceca, ileum, duodenum, gall bladder, and liver samples were obtained from 29 mice. Shotgun whole genome sequencing and UPLC-MS were used to determine the cecal microbiome and metabonome. DNA was extracted from cecal content and then sequenced by The Genome Analysis Centre (n=6-8 per group). Targeted and untargeted pathway analyses were performed to predict the systemic effects of the altered metagenome and metabolite profiles. Dietary cholic acid supplementation was used to determine whether the observed alterations could be overcome by intestinal bile acids functioning as FXR agonists.

Results: Human and murine pregnancy were associated with reduced intestinal FXR signaling, with lower FGF19/15 and resultant increased hepatic bile acid synthesis. Terminal ileal ASBT protein was reduced in murine pregnancy. Cecal bile acid conjugation was reduced in pregnancy due to elevated bile salt hydrolase-encoding Bacteroidetes. Cholic acid supplementation induced intestinal FXR signaling, which was not abrogated by pregnancy, with strikingly similar changes to the microbiota and metabonome as identified in pregnancy.

Conclusion: The altered intestinal microbiota of pregnancy enhance bile acid deconjugation, reducing ileal bile acid uptake and lowering FXR induction in enterocytes. This exacerbates the effects mediated by reduced bile acid uptake transporters in pregnancy. Thus, in pregnant women and mice, there is reduced FGF19/15-mediated hepatic repression of hepatic bile acid synthesis, resulting in hypercholanemia.

Abstract #17: BIRTH CONTROL TALES: TESTING OF THEORY BASED CONTRACEPTION EDUCATIONAL COMICS FOR ADOLESCENTS

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Dr. Nirupama Desilva - University of Oklahoma—Tulsa

Background: In the United States, adolescents account for 15% of unintended pregnancies annually. A study by McNicol suggests that educational comics can improve comprehension of factual information regarding health conditions, as well as provide a better understanding of the social and psychological aspects of a given illness. Educational comics on contraception may be a beneficial tool in targeting the adolescent population to promote awareness and knowledge, as well as to increase use of and compliance with various birth control methods.

Methods: This is an IRB approved study that employs a pretest/post-test design to evaluate a set of four educational comics that focus on the topics of the intrauterine device, the birth control implant, the birth control shot, and combined hormonal contraceptives (pill, patch, and ring). The target population is English speaking women aged 15-18. Teens who are currently pregnant or have used the desired birth control option in the past are excluded.

Subjective knowledge on a contraceptive option is assessed pre and post exposure to that birth control comic. Social and demographic variables are also collected. Descriptive statistics will be used.

Results: Data collection is ongoing with a goal of 120 total participants. To date, 25 participants have been recruited. Prior to learning about the information through a comic, 43% reported learning about contraception from peers, and 39% from the internet. The general reaction to the comics was favorable with 80% reporting that they “really liked” the comic and 20% responding a more neutral reaction to the comic. No participants report not liking the comic.The comics were reported to be easy to understand by the majority of participants.

Conclusions: Adolescents have been reported to have a generally favorable reaction to interacting with comics. Our preliminary results reveal that the comics used in our study can be a useful tool in the adolescent population to improve short term subjective knowledge on contraceptive options. Further, it appears that the format provides education in an easy to understand manner. Last, as the majority of participants note they seek information from non-medical sources, our data suggests that the birth control comics could be a superior method for contraception education amongst adolescents.

Abstract #22: ASSOCIATION OF VERTICAL JUMP PROTOCOLS TO AGILITY PERFORMANCE IN YOUTH VOLLEYBALL PLAYERS

Mr. Garrett Bossert - The University of Tulsa/Titan Sports and Performance Center (The Sports Armory)
Dr. William Hale - The University of Tulsa
Mr. Jeff Pace - The Sports Armory

Background: Unique performance-related attributes for the sport of volleyball include speed, maximal vertical jump, and frequent change-of-direction(agility). Volleyball players must generate high levels of force at high rates-of-speed with change-of-direction when performing an approach jump, diving, landing, blocking, and/or spiking. Vertical jumping ability, specific to volleyball, can be assessed through various types of vertical jumping protocols such as the block vertical jump (BVJ), the counter-movement vertical jump (CMJ), and the two-step approach vertical jump (AVJ). Sport-specific agility testing for volleyball can be assessed with a 9-cone test to determine the athletes' ability to generate quick and accurate movement with change-of-direction and/or acceleration and deceleration. The purpose of this study was to determine if a significant association exists between three different vertical jump protocols and agility performance in youth female volleyball players.
Methods: Following IRB approval, fourteen female youth volleyball players were recruited for this study (ages: 14±1.7) who were enrolled in a summer conditioning program. The average height and weight of the volleyball players were 67.35 inches and 152 pounds. Three vertical jump protocols (BVJ, CMJ, AVJ) were administered during the first week of the summer conditioning period. The best of three trials was retained for each of the three vertical jump protocols with a three minute rest between trials and a ten minute rest between protocols. Athletes then completed a 9-cone test of agility to determine change of direction ability. The best of two trials for the 9-cone test was retained with a three minute rest between trials. Data was recorded and loaded into SPSS for statistical analyses.
Results: Prior to data comparisons, a Kolmogorov-Smirnov test of normality was performed for each of the four variables and determined to be from a normal distribution (BVJ: $p = .096$, CMJ: $p = 0.200$, AVJ: $p = .187$, 9-cone: $p = .127$). A series of three Pearson tests of bi-variate correlation were performed on vertical jump type with agility performance. All three vertical jump protocols were determined to have significant correlation with agility performance, BVJ: $r = -.714$, $p = .006$; CMJ: $r = -5.81$, $p = .029$; AVJ: $r = -.698$, .006.
Conclusion: Results of the current study indicate there is a significant indirect relationship between three vertical jump protocols and agility performance in youth female volleyball players. Therefore, for volleyball specific training programs, increasing force production in the vertical domain may yield improvements in certain types of agility performances.

Abstract #30: DOES FROZEN EMBRYO TRANSFER INCREASE IN VITRO FERTILIZATION PREGNANCY RATES?

Dr. Ashley Brown - University of Oklahoma--Tulsa
Dr. John Clark Bundren - University of Oklahoma--Tulsa
Dr. Zachary Hamilton - University of Oklahoma--Tulsa
Dr. Nasir Mushtaq - University of Oklahoma—Tulsa

Objective: Infertility is a common condition in the United States; roughly 10% of women have difficulty conceiving. Since its conception, over 1 million babies have been born in the United States via assisted reproductive technologies. Goals of in vitro fertilization include pregnancy, singleton gestation, and an uncomplicated pregnancy with a term delivery. Thus far, few factors have predicted increased success of embryo transfer. This study was designed to determine if any factors predict better success with a frozen embryo transfer than with a fresh embryo transfer.
Methods: We performed a retrospective cohort chart review of those women at Bennett Fertility Institute undergoing oocyte retrieval between the years 2011-2016. 23 data points from these charts were obtained. Donor eggs and embryos, as well as day 3 embryo transfers and day 5 embryos that did not grow to the blastocyst stage were excluded from our study. Statistical analysis was performed to evaluate if any patient characteristics or embryo characteristics were associated with increased pregnancy and delivery rates in frozen embryo transfers than in fresh embryo transfers.
Results: Charts from 2011-2016 were reviewed; 670 embryos were transferred during this time by 3 providers. 126 were of frozen embryos (18.8%), while the remainder was fresh embryo transfers. Patient demographics were similar between the two groups, with the exception of patient age at retrieval, which was older in the frozen transfer group (p=0.0339). As the number of embryos transferred increased, so did the pregnancy and delivery rates (p=0.0167). In our group, fresh embryo transfers were more likely to result in pregnancy (p=0.0008), although delivery rates were not statistically significant. The Estradiol level at the time of hCG trigger was significantly higher in the frozen embryo transfer group (p=0.0135), likely due to the increased risk of ovarian hyperstimulation if embryo transfer were to occur at supraphysiologic Estradiol levels.
Conclusions: Few patient and embryo characteristics predicted increased success of frozen embryo transfer. As the number of embryos transferred increased, the pregnancy and delivery rates also increased. Patients with a supraphysiologic Estradiol level may benefit from frozen embryo transfer at a later date.

Abstract #33: HEART RATE VARIABILITY AND SLEEP DURATION IN COLLEGIATE FOOTBALL PLAYERS

Ms. Tori Stafford - University of Tulsa

Introduction: Effective conditioning uses training loads combined with adequate recovery to optimize athlete performance. With the prevalence of wearable devices, more athletes are focusing on monitoring physiological changes of training adaptation and recovery with variables such as heart rate variability (HRV) and sleep duration (SD). Athletes who lack proper recovery are at greater risk for injury, have decreases in performance, and can experience negative cognitive changes. Biometric variables such as HRV and SD can provide insight into athletes' homeostatic and autonomic function, both important aspects of recovery. The purpose of this study was to assess the association between HRV and SD in members of a Division I collegiate football team during a 6-week summer conditioning program.

Methods: Twenty-three male student-athletes from a Division I Football team were purposively selected in coordination with the sports performance staff to wear a WHOOP recovery tracking device at all times during a 6-week summer conditioning program. The WHOOP recovery tracking device measures HRV (RMSSD) and SD (hrs/day), among other variables of work and recovery. Athletes completed their scheduled strength and conditioning program, which included weekly sessions of resistance training x 3, speed and agility training x 4, and football specific drills for metabolic conditioning x 2. The WHOOP recovery tracking device is designed to be worn throughout the day, including during workouts and sleep. Following the 6-week summer conditioning program, data was sorted and uploaded into SPSS for statistical analysis.

Results: Adequate data normality of HRV ($p = .510$) and SD ($p = .341$) was determined prior to statistical analysis via a Shapiro-Wilk test. A Pearson bivariate test of correlation was performed. A significant correlation was observed between HRV (RMSSD) and SD (hrs/day), $r = .95$, $p = .033$. Means and standard deviations for HRV and SD were 88.2±3.63 and 4.92±.15 respectively.

Conclusion: A significant direct association between HRV and SD existed in Division I football players during a 6-week summer conditioning program. Adequate sleep duration is important to improve recovery as measured by autonomic function.

Abstract #44: EXAMINING THE FINANCIAL IMPACT OF A NEW CARE COORDINATION REIMBURSEMENT POLICY

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Mr. Toen Starkweather - OU-TU School of Community Medicine
Ms. Carol Kuplicki - OU-TU School of Community Medicine
Mr. Jim Craddock - OU-TU School of Community Medicine
Ms. Rachel Mix - OU-TU School of Community Medicine
Ms. Juell Homco - OU-TU School of Community Medicine

Background: In January 2018, the Oklahoma Health Care Authority (OHCA) implemented a new policy eliminating Per-Member-Per-Month (PMPM) care coordination reimbursement for patients not seen by their assigned provider within a 15 month period. The policy was established to encourage strong patient-primary care provider relationships. This project aimed to better understand characteristics of Sooner Health Access Network (HAN) patients not seen during a 15 month period at OU Physicians-Tulsa and provide a conservative estimate of the potential financial impact of this policy.
Methods: Sooner HAN patients attributed to OU Tulsa's Patient-Centered Medical Home (PCMH) in December 2018 were identified using OHCA roster files. In January 2019, office visits to a patient's assigned provider were determined through analysis of OHCA claims data for September 1, 2017—November 30, 2018. Potential financial loss to OU Physicians-Tulsa was estimated for patients without a visit based on two reimbursement methods: 1) loss in PMPM care coordination reimbursement in December 2018 and 2) summing the Fee-for-Service reimbursement for one annual wellness visit for each patient without a visit. The Fee-For-Service reimbursements were estimated by averaging new and established preventive visit rates for two age groups: children (0-17) and adults (18+) to determine revenue lost from one visit. Next, demographic characteristics including age category, gender, and race/ethnicity were compared for patients seen during the 15 month timeframe and those not seen.
Results: There were 25,243 patients assigned to OU Physician-Tulsa's PCMH in December 2018. Of these, 8,336 patients (33.0%) did not have a visit during the timeframe: 5,948 children, 2,352 adults, and 36 individuals of unknown age. The estimated financial loss in PMPM care coordination reimbursement for the population without a visit was $55,663.34. Additionally, this population represents at least $1,100,000 in lost revenue assuming only one missed wellness visit per patient. Patients not seen within the 15 month timeframe were more likely to be female compared to patients with at least one visit (54.8% vs. 53.0%, $p=0.008$) and less likely to be Hispanic (27.8% vs. 40.0%, $p<0.001$).
Conclusions: The financial impact of OHCA's care coordination reimbursement policy is significant and warrants targeted intervention. Among OU Physician-Tulsa's Sooner HAN population, interventions to promote annual wellness visits should target Non-Hispanic whites, females, and patients 18 years of age and older. These findings should also be used to further evaluate barriers to attending annual visits among these patient populations.

Abstract #52: USE OF POST-PARTUM LONG ACTING REVERSIBLE CONTRACEPTION IN AN ACADEMIC CENTER OBSTETRIC POPULATION

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Dr. Aleze Krumholz - University of Oklahoma--Tulsa
Dr. Monica Henning - University of Oklahoma--Tulsa
Dr. Nasir Mushtaq - University of Oklahoma--Tulsa
Dr. Karen Gold - University of Oklahoma—Tulsa

Objectives: To evaluate the use of long acting reversible contraception (LARC) in the postpartum period at an academic center and explore factors that influence that use.
Study Design: A retrospective cross-sectional chart review was completed for patients who delivered over one year after receiving prenatal care with the University of Oklahoma School of Community Medicine (OUSCM), Women's Health Care Specialists (WHCS). Data was collected for multiple factors including social, prenatal, intrapartum and postpartum care. Univariate and multivariate statistical analysis was competed and significant association between LARC users and non-users for each variable or risk factor was explored.
Results: 178 of 281 of patients (63%) attended a postpartum visit. 57 of 281 of patients (20%) chose to use a LARC method for contraception. Univariate analysis revealed that age, occupation, gestational age at time of delivery, LARC as a planned method of contraception in the prenatal period, and LARC as planned method of contraception at hospital discharge, all have a statistically significant association with LARC use. After multivariate analysis, antenatal plan for IUD, OR 5.6 (95% CI 2.46- 12.89), discharge plan for an Implant, OR 9.9 (95% CI 4.52-21.72), and discharge plan for an IUD-Mirena©, OR 4.5 (1.67-12.12) remained statistically significant as factors associated with LARC use.
Conclusions: Within our academic center population, contraception counseling leading to patient intent to use LARC is associated with increased use of LARC in the postpartum period. Further study is needed to explore what counseling methods are effective and to further define barriers to LARC use.

Abstract #67: NATIONAL ESTIMATES OF RECURRENT INTRACRANIAL HEMORRHAGE: EFFECT OF TREATMENT MODALITY

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Dr. Mohammad Rauf - Texas Tech Health Sciences Center
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Background: The estimates of recurrent intracranial hemorrhages in the post hospitalization period among patients treated for ruptured intracranial aneurysms are not available outside clinical trials.
Methods: We identified all readmissions related to new subarachnoid hemorrhage (SAH) in the nationally representative data for all patients hospitalized for SAH using the 2013 Nationwide Readmissions Database (NRD) who had undergone endovascular or surgical treatment. Cox proportional hazards analysis was used to assess the relative risk (RR) of recurrent intracranial hemorrhage for patients in treatment cohorts after adjusting for potential confounders. The 1-year survival was estimated for both treatment groups by using Kaplan-Meier survival method.
Results: A total of 5,844 patients with SAH were treated with either endovascular (n = 2,843, 48.6%) or surgical treatment (n = 3000, 51.4%). The rate of all-cause in-hospital mortality (12.1% vs 10.2%, P = 0.1895) was similar among patients treated with endovascular or surgical treatment. The estimated 1-year recurrent intracranial hemorrhage survival was 99.5% and 97.4% in patients who underwent surgical and endovascular treatments, respectively (P= <0.0001). After adjusting for age, and APDRG severity score, the RRs of recurrent any intracranial hemorrhage was higher with endovascular treatment (RR, 6.0; 95% Confidence Interval (CI), 2.3-15.7 p= 0.0002). The rates of SAH (RR, 6.1; 95% CI, 2.1-17.9 p= <0.0001) was significantly higher and a trend was observed for higher rate of intracerebral hemorrhage (RR, 6.2; 95% confidence interval, 0.7-52.5 p=0.0940) among patients treated with endovascular modality.
Conclusion: Although the rates of recurrent intracranial hemorrhage related hospitalization were low among patients with ruptured intracranial aneurysms, there was a higher rate among patients treated with endovascular treatment.

Abstract #68: PRE-SURGICAL DUAL ANTI-PLATELET THERAPY IMPACTING SURVIVAL IN PATIENTS REQUIRING SURGICAL REVASCURILIZATION

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Mr. Abdul Qadar - University of Oklahoma--Tulsa
Mr. Raja Ullah - University of Oklahoma

Background: Dual antiplatelet therapy(DAPT), older age, evidence of heart failure, hypertension, smoking, low molecular weight heparin and anemia are known risk factors delaying coronary artery bypass graft(CABG) after diagnosis of complex coronary artery disease has been established. It is well known that delay in CABG does not cause adverse clinical outcomes; not much has been published on the impact of pretreatment DAPT on survival as a lone factor. We sought to investigate this question in a single center retrospective study.
Methods: We compared incidence proportion of all-cause mortality, cardiovascular(CV) mortality and 30-day mortality in patients who received DAPT versus AMT prior to CABG.Patients were classified into two groups: acute coronary syndrome (ACS) and stable ischemic heart disease (SIHD).Majority of ACS patients had history of myocardial infarction within 90 days prior to CABG. Outcome variables were compared between treatment groups in ACS and SIHD separately.Categorical variables were compared using Chi-square tests.Normality assumption for each of the continuous variables was assessed using the Shapiro-Wilk test, and treatment group comparisons were performed using Mann-Whitney test (or t-test). Significance was based on a two-tailed p-value less than 0.05.All statistical analyses were performed using SPSS version 20.0.
Results: Of 3900 patients reviewed between January 2012 to December 2015, 2476 patients, who followed at our institute, were included in the analysis.Patients with ACS presentation, h/o stroke, stable angina, peripheral arterial disease and previous stent were more likely to be on DAPT prior to CABG.
In the SIHD group (n=1830), patients placed on DAPT (n=410) prior to CABG had similar post-CABG all-cause mortality (5.1 % vs 5.3 %; p=1.00), CV mortality (2.5 % vs 3.1%; p=0.618) and 30-day mortality (1.5 % vs 1.3%; p=0.795), compared to patients on AMT (n=1420). In the ACS group (n=646), patients on DAPT (n=188) prior to CABG had similar post-CABG all-cause mortality (8.0 % vs 7.6 %; p= 0.91); but trend towards lower CV mortality (3.3% vs 5.5%; p=0.465) and 30-day mortality (1.1% vs 3.01%; p=0.198), compared to patients on AMT (n=456). Regression analysis showed beta blockers and DAPT after CABG showed mortality benefit in both SIHD and ACS patients (p=<0.01).
Conclusion: There was no mortality benefit of pretreatment DAPT in patients with SIHD; however, there was a trend towards lower CV and 30-day mortality in patients with ACS who received DAPT compared to patients on AMT. Further research, perhaps with larger sample of ACS patients, is needed to confirm above results.

Abstract #69: CORNEAL WOUND HEALING MECHANISMS MODULATED BY NOVEL ANTIMICROBIAL PEPTIDES

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Mr. Creig Land - University of Oklahoma Health Sciences Center
Dr. Anne Kasus-Jacobi - University of Oklahoma Health Sciences Center

Background: Corneal abrasion is the most common eye injury. If corneal re-epithelialization is not optimal bacterial infection and vision loss can occur. The neutrophil protein CAP37 has wound healing and antimicrobial properties and our goal is to develop therapeutic peptides derived from CAP37 for the treatment of corneal abrasion and vision-threatening bacterial keratitis. This study was designed to identify membrane receptor(s) mediating the wound-healing effects of CAP37 and CAP37-derived bioactive peptides in corneal epithelial cells.
Methods: Corneal re-epithelialization was measured using a mouse corneal epithelium abrasion model, with and without treatment with CAP37 or derived peptides. To identify the receptors that mediate re-epithelialization induced by CAP37, we used an innovative ligand-based receptor capture method based on a TriCEPS reagent that features (1) an NHS group for coupling with the ligand protein, (2) a hydrazine cross-linker for coupling to the receptor, and (3) a biotin for purification of the complex. Interactions of CAP37 and its bioactive peptides with potential receptor candidates were then confirmed in vitro, using ELISA, and far-dot-blotting analysis.
Results: We found that full-length CAP37 and CAP37-derived peptides based on a specific domain of the native CAP37 could accelerate corneal re-epithelialization in a mouse abrasion model. Using CAP37 coupled with TriCEPS on human corneal epithelial cells, we identified 17 proteins as most likely candidates to interact specifically with CAP37. Surprisingly, none of these candidates was a membrane receptor. Four potential candidates were tested in vitro for interaction with CAP37 and the calgranulin proteins S100-A8 and S100-A9 were confirmed to interact specifically and significantly with CAP37 and two of the bioactive peptides tested.
Conclusion: S100-A8 and S100-A9 are ligands of the receptor for advanced glycation end-products (RAGE) and are important players in ocular surface inflammatory diseases through the activation of Toll-like receptor 4 (TLR4). We speculate that a physical interaction of CAP37 and its peptides with S100-A8 and S100-A9 could modulate the activation of RAGE and/or TLR4 on corneal epithelial cells, thus promoting corneal wound healing. These findings will be key to optimization and translation of CAP37-derived peptides into innovative therapeutics with the dual effects of killing pathogens and promoting wound healing.

Abstract #70: DETECTION OF CERVICAL INTRAEPITHELIAL NEOPLASIA WITH DIFFERING CERVICAL BIOPSY PRACTICE PATTERNS

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Dr. Michael Gold - University of Oklahoma--Tulsa
Dr. Mary Williams - University of Oklahoma—Tulsa

Background: Colposcopy allows visual characterization of a magnified cervix to guide biopsy sampling for histologic diagnosis to distinguish high-risk women who need treatment from lower-risk women who may undergo surveillance according to management guidelines. Limited data exists regarding practice patterns of practitioners performing cervical biopsy procedures (CBP) and their effectiveness in detecting high-grade cervical lesions. Evaluation of these practice patterns may provide opportunities for standardization and training of colposcopic techniques.

Methods: A retrospective computer database review was performed on de-identified cervical biopsy specimens processed by Regional Medical Laboratory, between 01/01/2012-06/30/2015, in the Tulsa region. Biopsy results were divided into two categories of cervical intraepithelial neoplasia (CIN)

Results: In total, 8173 cervical biopsy specimens were analyzed among 299 providers in the dataset. Batched specimens constituted 50.6% and individual, 49.4% of specimens. Of the 299 providers in the dataset, there were 68 providers (22.7%) with 42+ specimens in the dataset, 232 (77.3%) with less than 42 specimens. A higher proportion of CIN2+ was detected with batched than individual specimens (30.8% vs. 26.1%, respectively). After accounting for providers with multiple specimens in the dataset, CIN2+ was detected 1.17 times more in batched than in individual specimens ($p<0.0001$). Providers, who performed more CBP, had a lower proportion of CIN2+ biopsy diagnoses (27.4%) than providers with fewer specimens (32.2%, $p=0.019$). The diagnosis of CIN2+ varied by provider groups. The proportion of samples with CIN2+ diagnosis was comparable between specimens with Endocervical curretage (ECC) (28.6%) and without ECC (28.3%).

Conclusion: High-grade lesions were detected more often in batched than with individual specimens, congruent with prior studies. Providers in the dataset performing more biopsies detected less CIN2+ than their counterparts who performed less CBPs. Furthermore, there was no clear trend of CIN2+ diagnoses with increasing provider biopsy frequencies, nor was there an association between provider group and specimen type. Collection of ECC does not appear to increase CIN2+ detection in batched or individual specimens. However, further details regarding provider specialty, ECC diagnoses, colposcopy findings may provide more information regarding effectiveness of provider practices.

Abstract #71: MULTIVARIATE PATTERN ANALYSIS IN MAJOR DEPRESSIVE DISORDER: PREDICTING FMRI EMOTIONAL FACES TASK

Mr. Srivats Srinivasan - University of Tulsa
Dr. Robin Aupperle - Laureate Institute for Brain Research
Mr. Tim McDermott - Laureate Institute for Brain Research

Background: Traditional neuroimaging approaches using univariate analyses indicate that major depressive disorder is often associated with dysfunction in emotional processing networks. Multi-variate pattern analyses (MVPA) are novel statistical methods that examine multivariate correlations of patterns across the brain. MVPA shows greater generalizability for individuals than univariate analyses and has been useful in identifying regions in the brain that differentially predict various emotional states. In this study, a neural pattern was developed with MVPA for emotional face processing and examined to determine if it was reliable across both healthy controls and individuals with major depressive disorder (MDD).
Methods: In study 1, a LASSO multivariate analysis was first applied to a sample of healthy participants (n=39) to create the MVPA predictive pattern that best identified whether participants were viewing either emotional faces or shapes during fMRI. This pattern was tested on two independent samples: study 2, which included 40 healthy controls (HC), and study 3, which included 43 individuals diagnosed with MDD.
Results: Results with the training set (study 1) identified a pattern with 95.28% sensitivity and 93.33% specificity for predicting emotional faces. Results from Studies 2 and 3 are pending.
Conclusion: Initial findings suggest MVPA is robust for identifying networks most predictive of emotional face processing. Comparing pattern predictability for healthy and depressed participants will give more insight into the utility of MVPA within clinical populations. Future studies exploring different study groups and analyses using MVPA are needed to establish generalizability and utility for addressing clinically-relevant questions.

Abstract #80: THE IMPACT OF NEW GUIDELINES ON THE PREVALENCE OF HYPERTENSION IN CHILDREN

Dr. Michelle Condren - University of Oklahoma--Tulsa
Dr. Jessamyn Carter - University of Oklahoma--Tulsa
Dr. Nasir Mushtaq - University of Oklahoma Health Sciences Center, College of Medicine
Dr. Scott Puckett - University of Oklahoma--Tulsa
Dr. Krista Kezbers – University of Oklahoma--Tulsa
Dr. Samie Sabet - University of Oklahoma--Tulsa
Dr. Danielle Morgan - University of Oklahoma—Tulsa

Background: The American Academy of Pediatrics' Subcommittee on Screening and Management of High Blood Pressure in Children, with the endorsement of the American Heart Association, published new clinical practice guidelines for blood pressure screenings in pediatric patients in 2017, an update and revision to the 2004 "Fourth Report on the Diagnosis, Evaluation, and Treatment of High Blood Pressure in Children and Adolescents." The new guidelines change the thresholds for evaluating pediatric blood pressures. This study quantifies the potential effect of the new guidelines on the prevalence of abnormal blood pressure and hypertension (HTN) in pediatric patients.
Methods: This was a cross-sectional study of blood pressure screening values for children between 3 and 18 years of age obtained during well child visits at primary care clinics between July and December 2017. Blood pressure values were evaluated using both the Fourth Report and the new guideline published in 2017. Blood pressures of individual patients were divided into sub-populations using the following variables:patient age, gender, race, ethnicity, height percentile, weight status, and body mass index percentile. Blood pressure classifications were compared between the old and new guidelines.
Results: A total of 2635 screening blood pressure measurements were extracted from the electronic medical record (EMR), of which 2600 blood pressures were eligible for analysis and categorization. Six cases were excluded due to missing BP values; 29 cases were excluded due to missing information on height or weight in the EMR. The prevalence of hypertension increased to 17.85% using the 2017 Clinical Practice Guidelines in comparison to 9.5% using the 2004 Fourth Report. An increased prevalence of stage 1 and stage 2 hypertension was found in all sub-populations, with the most dramatic increases in the following: male, ages 3-12, Hispanic ethnicity, race designated as other, normal weight, and overweight.
Conclusion: The 2017 Clinical Practice Guidelines increased the prevalence of elevated blood pressure and stage 1 and stage 2 hypertension in children and adolescents. This increase is expected to require more follow-up and intervention than previously expected for this patient population to prevent future morbidity and mortality as these patients become adults.

Abstract #89: VALIDATION OF WEARABLE SENSOR TECHNOLOGY

Mr. Jacob Thomas - University of Tulsa
Dr. Roger Kollock - University of Tulsa

CONTEXT: Lower extremity injuries are a common occurrence in collegiate athletes. One cause for these injuries can be asymmetries in the athlete's lower extremities when landing or cutting. These asymmetries often go unnoticed which can lead to injury and re-injury. A new wearable sensor technology, approved by the Food and Drug Administration (FDA), called the dorsaVi™ might help assist in detecting these asymmetries.
OBJECTIVE: The objective of this project was to determine the validity of the analytics derived from the dorsaVi™, specifically average ground reaction force and contact time. **STUDY DESIGN:** Cross-sectional. The main outcome measures averaged the max vertical ground reaction force (Newtons) from the dorsaVi™ and validation instrument (i.e. Bertec FP4060-05-PT force plates, Bertec Corp, Columbus, OH). **SETTING:** Controlled laboratory. **PATIENTS OR OTHER PARTICIPANTS:** Twenty-two college-aged recreationally active participants were recruited for the study. **INTERVENTION:** Participants performed a one-minute jogging task at 180 bpm with dorsaVi™ markers attached while striking force plates. **MAIN OUTCOME MEASURE(S):** The main outcome measures were mean peak vertical ground reaction force (mPVGRF), measured in Newtons (N). The mean difference between devices was assessed using a one-sample t-test. Alpha level was set at 0.05. To assess degree of agreement between two devices, Bland-Altman plots with upper and lower limits of agreement were plotted for each variable to be compared across devices.
RESULTS: The mean difference in mPVGRF between the validation device (1678.42±463.18 N) and dorsaVi™ (890.52±533.20 N) did significantly differ from zero (mean difference = 787.89±391.23 N, $p<.001$, 95% CI = 700.83 to 874.96). Bland-Altman plot depicted a mean difference (i.e. bias) of 787.89 N with the lower and upper level of agreement of 21.08 N and 1554.7 N respectively for mPVGRF. **CONCLUSIONS:** Based on the results of the study and current clinical practice, the dorsaVi™ does not appear to be an adequate substitute for acquiring mPVGRF or determining right-to-left lower limb asymmetry.

Abstract #104: GARTLAND TYPE II SUPRACONDYLAR HUMERUS FRACTURES: OUTCOMES OF CLOSED REDUCTION IN THE EMERGENCY DEPARTMENT

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Dr. Samuel Thompson - University of Oklahoma
Dr. Scott Conant - University of Oklahoma
Dr. David Chong - University of Oklahoma Health Sciences Center

Purpose: The optimal treatment of Gartland type II supracondylar humerus fractures remains controversial. There has been a recent trend towards closed reduction and percutaneous pinning over closed management with casting. We report the results of a series of patients with type II fractures who underwent closed reduction and immobilization using conscious sedation in the emergency department. Our goal was to determine the rate of successful reductions and to identify predictors of failure of non-operative management.

Methods: This was a retrospective cohort study of pediatric patients who underwent closed reduction of type II supracondylar humerus fractures with the use of conscious sedation in the emergency department. The primary outcome measure was the need for operative intervention following reduction. Pre- and post-reduction radiographs were reviewed to determine degree of fracture extension, anterior humeral line index, Bauman's angle, and splint flexion angle.

Results: A total of 54 patients (54 elbows) were included in this study. The mean overall age was 5.2 +/- 2.5 years. Median follow-up was 40 days. Following closed reduction in the emergency department, 38 (70%) patients were successfully managed non-operatively with casting and 16 (30%) patients required operative intervention. The degree of fracture extension on the injury radiograph was 13.2 +/- 8.4 degrees in the non-operative group compared with 19.8 +/- 7.5 degrees in the operative group ($p = 0.008$). The post-reduction degree of fracture extension was 3.0 +/- 3.4 degrees in the non-operative group and 10.0 +/- 7.2 degrees in the operative group ($p < 0.0001$). The mean anterior humeral line index on the injury radiograph was 0.34 in the non-operative group and 0.13 in the operative group ($p = 0.104$). The mean anterior humeral line index on the post-reduction radiograph was 1.2 in the non-operative group and 0.38 in the operative group ($p = 0.0002$). Patient age, pre- and post-reduction Bauman's angle, and the post-reduction splint flexion angle did not differ significantly between groups.

Conclusions: Closed reduction in the emergency department is a viable treatment option for Gartland type II supracondylar humerus fractures. Increasing fracture extension and decreasing anterior humeral line index can help predict failure of non-operative management following closed reduction.

Abstract #118: TRAUMA-INFORMED CARE AND ADVERSE CHILDHOOD EXPERIENCES IN HEALTHCARE

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Dr. Martina Jelley - OU
Dr. Fran Wen - OU Physicians - Tulsa
Dr. Kim Coon - OU Physicians - Tulsa
Dr. Julie Miller Cribbs - University of Oklahoma--Tulsa
Dr. Jedediah Bragg – OU-Tulsa
Ms. Kristin Rodriguez - OU-TU College of Community Medicine
Dr. Shannon Gwin - University of Oklahoma—Tulsa

Background: Adverse Childhood Experiences (ACEs) are associated with poor health outcomes as an adult, including smoking/alcohol/substance abuse, obesity, heart and lung disease, cancer, diabetes and others. As a public health issue, ACEs are a leading determinant of health and social well-being. Trauma is widespread and healthcare professionals are consistently in contact with individuals affected by trauma. Trauma-informed care (TIC) acknowledges that health care organizations and care teams need to have a complete picture of a patient's current and past life situation in order to provide effective health care services with a healing orientation. Adopting trauma-informed practices can potentially improve patient engagement, treatment adherence, and health outcomes, as well as provider and staff wellness. The purpose of this study is to measure the awareness and knowledge of ACEs and TIC and ACE scores of staff and providers at OU Physicians. These findings will guide implementation of trauma-informed care at OU.

Methods: This cross-sectional study measured ACEs (10-item scale), knowledge of ACEs and TIC (6-item scale) of all employees of OU-Physicians. The employees were emailed a link to a Qualtrics survey, where above mentioned measures were collected along with demographic information (i.e., gender, race, age, job title, department, and years of patient work experience). Data was collected and analyzed using IBM SPSS v. 24.

Results: Preliminary findings include descriptive and comparison reports. The sample population (n=169) was characterized as male (23%), female (76%) and other (1%) in job titles categorized as staff (60%), faculty (19%), and trainee (21%). 47.1% answered that they were somewhat, very or extremely familiar with the term trauma informed care while 76.3% answered that they were somewhat, very or extremely familiar with the term ACEs. Over 85% replied that TIC would be relevant to their practice. Nurses reported the highest mean ACEs scores (4/10) and faculty and trainees reported lowest mean ACEs score (1/10).

Conclusion: While there is a good level of familiarity with ACEs at OU Physicians, there is less understanding of trauma-informed care yet a high level of relevance to staff and providers. As expected, many staff have endured ACEs. We plan to use this information to create an effective implementation of trauma-informed care practices within OU-Physicians.

Abstract #119: T-CELL SUBSETS ASSOCIATED WITH CYTOMEGALOVIRUS AND FAMILY HISTORY OF MOOD DISORDER

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Dr. Jonathan Savitz - Laureate Institute for Brain Research

Background: Major depressive disorder (MDD) is a risk factor for medical morbidity that may be related to elevated inflammation and suppressed adaptive immunity. Adaptive immunity is impaired by age related immunosenescence, which is characterized by the loss of naïve T-cells and the reciprocal accumulation of memory T-cells together with the loss of co-stimulatory molecules on T-cells. This study tested whether MDD influences age-related reduction of T-cell costimulatory molecules in the context of cytomegalovirus (CMV) infection, a common beta-herpesvirus known to increase T-cell immunosenescence.

Methods: Senescence-associated T-cell phenotypes were measured in volunteers with a DSM-IV diagnosis of MDD (n=72, mean age=35.8(10.2), 76% female, 61% CMV+), individuals with no personal history of a psychiatric disorder, but with a first degree relative with a mood disorder (HR, n=46, mean age=34.0(10.6), 72% female, 61% CMV+), and healthy controls with no personal or family history of psychiatric illness (n=54, mean age=34.7(10.7), 67% female, 44% CMV+). Plasma CMV IgG antibodies were measured by immunosorbent assay. Flow cytometry on PBMCs was used to quantify the frequency of cells lacking the co-stimulatory cell surface proteins CD27 and CD28 within CD4+ and CD8+ T-cell subsets, naive (CCR7+CD45RA+), effector memory (CCR7-CD45RA-), central memory (CCR7+CD45RA-) and terminally differentiated effector memory (CCR7-CD45RA+).

Results: ANCOVA models controlling for age and sex showed that a positive CMV serology was associated with a greater frequency of CD27-CD28- cells (p's<0.01) within all four subsets of CD4+ T-cells and all four subsets of CD8+ T-cells. In these models, neither diagnosis nor familial risk for MDD was significant. However, the HR group was associated with an increased frequency of CD8+ T-cells (p=0.04) and reduced CCR7 expression on CD8+ T-cells (p=0.01) compared to the HC group.

Conclusions: We find an association between CMV infection and age-related T-cell phenotypes but no significant effect of MDD. Familial risk for MDD may be associated with an immune phenotype skewed toward effector CD8+ T-cells, indicating increased T-cell trafficking to the periphery. Reduced CD8+ cytotoxicity and proliferative response has been reported previously in MDD populations but without evaluating the effect of CMV. Since depression is associated with other risk factors for CMV, such as low socioeconomic status and early life stress, this study highlights CMV's importance as a cofactor in comparative studies of T-cell function.

Abstract #125: MATERNAL CHILDHOOD ADVERSITY AND INTERGENERATIONAL TRANSMISSION OF RISK DURING PREGNANCY: PRELIMINARY BIOMARKER RESULTS FROM HATCH PROJECT

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Mrs. Brenda Davis - University of Oklahoma - Tulsa
Mrs. Ashlee Rempel - University of Oklahoma - Tulsa
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Dr. Karina Shreffler - Oklahoma State University - College of Human Sciences

Background: Multiple studies show that higher adverse childhood experiences (ACEs) in mothers are linked to higher adverse birth outcomes. Adverse birth outcomes may operate as a pathway for intergenerational transmission of ACEs from mothers to their children. To provide a better understanding and health care for pregnant women and the children in Oklahoma, psychosocial and physiological data are critically needed to assess the risk of maternal ACEs and adverse birth outcomes. Therefore, the HATCH Project sought to fill the gap in our knowledge in maternal ACEs and its outcome during pregnancy.

Methods: This study focused on the physiological pathway that links ACEs score and the levels of the biomarkers indicating stress. Pregnant women were recruited from OU and OSU women's health clinics. ACE scores and biological samples were collected at the time of enrollment among 177 eligible participants. Participants' ACEs scores (0-10) were divided into low (0-2), mid (3-6) and high (7-10) groups. Salivary cortisol, serum C-reactive protein (C-RP) and interleukin-1 receptor antagonist (IL-1Ra) levels were measured as biomarkers for psychosocial stress and systemic inflammation. We calculated biomarker scores as variation from the expected value for time of day and gestation at collection. The values of the biomarker were adjusted by ACEs scores and chronic health condition (HC) in the final analysis. We also analyzed the duration of newborns spent in NICU with mothers' ACEs scores.

Results: Low ACEs group shows overall low levels of variation in cortisol and IL-1Ra, indicating lower hormonal and stressed-induced inflammatory responses during pregnancy. Cortisol variation level is highest in mid ACEs group with no chronic HC, while IL-1Ra variation level is highest in mid ACEs group with chronic HC. C-RP variation level is positively correlated to participants' ACEs scores among those pregnant women with chronic HC. The moderate levels of cortisol and IL-1Ra variation in high ACEs group may represent the cumulative results of complex regulations after exposure to chronic stress. When analyzing the duration of baby spent in NICU, high maternal ACEs scores predicted longer stays in the NICU.

Conclusions: These results show the association between the maternal stress biomarkers with ACEs during pregnancy, supporting the current theory that mid to high maternal ACEs have a direct impact on adverse birth outcomes via the physiological pathway. The results provide a useful framework for examining the risk of adverse birth outcomes, which potentially informs earlier and more efficient prevention and intervention in clinical settings.

Abstract #129: THE ASSOCIATION OF HIP ABDUCTOR STRENGTH TO HIP AND KNEE KINEMATICS POST-FATIGUE

Mr. Alex Long - University of Tulsa
Dr. Roger Kollock - University of Tulsa

CONTEXT: Decreased hip abductor (AB) strength may lead to poor lower extremity alignment during weight-bearing activities and increase an athlete's injury susceptibility. **OBJECTIVE:** The objective of this project was to determine the relationship of AB strength to hip and knee kinematics during a single-leg landing task (SLL) post-peripheral fatigue in females.
STUDY DESIGN: Cross-sectional. **SETTING:** Controlled laboratory. **PATIENTS OR OTHER PARTICIPANTS:** Injury free and recreationally active female college students were recruited. **INTERVENTION:** Participants performed 3 repetitions of a SLL task on the dominant leg. Each repetition was separated by a 30-second rest period. A 3-D motion tracking system was used to track/record the participant's pattern of movement during the SLL. Following the SLL task, the participant performed an isometric strength assessment (ISA) of the AB of the dominant leg using a muscle strength-testing device. For the ISA the participant performed two, 3-second contractions separated by a 60-second rest period. After a 2-minute rest period, the participants performed two, 30-second contractions. Each 30-second contraction was separated by a 2-minute rest period. After the ISA, the participant performed a peripheral fatigue protocol on their dominant leg, which involved the participant jumping vertically 60 consecutive times as fast as possible on their dominant leg. Immediately following the fatigue protocol the participant again perform 3 repetitions of the SLL task.
MAIN OUTCOME MEASURE(S): The kinematic outcome measures were post-fatigue hip abduction (HAB) and knee abduction (KAB) angles at initial ground contact (IGC) and maximum vertical ground reaction force (mVGRF). The main outcome measures for strength were AB peak torque per kilogram of body mass (PT/kg) and AB fatigue index (FI) values. Bivariate correlations were performed to determine the association between muscular strength and kinematics. Alpha level was set at 0.05.
RESULTS: Sample population consisted of nine females (age, 20±1 years; height, 168.90±15.6 centimeters; weight, 69.78±21.2 kilograms.). AB FI was significantly ($p=0.028$) correlated to HAB angles at IGG ($r=0.808$), but not significantly correlated to KAB angles at IGC ($r=0.273$). AB FI was not significantly correlated to HAB ($r=0.718$) and KAB ($r=0.018$) angles at mVGRF. AB PT/kg was not significantly correlated to HAB ($r=0.398$) and KAB ($r=0.551$) at IGC or HAB ($r=0.039$) and KAB ($r=0.018$) at mVGRF.
CONCLUSIONS: The results suggest AB FI is related to HAB angles at IGC post-peripheral fatigue. This is a significant finding because it demonstrates the important role AB strength endurance (i.e. FI) plays in proper landing mechanics post-peripheral fatigue.

Abstract #131: RECREATING CRISPR-Cas9 INDUCED KNOCKOUTS IN ALGAL MODEL CHLAMYDOMONAS REINHARDTII

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Dr. Ty Johannes - University of Tulsa

Introduction: The CRISPR/Cas9 gene editing system is a highly selective and specific method for introducing transgenes in a multitude of organisms. However, utilization of CRISPR/Cas9 on algae strains has led to numerous challenges in the past ranging from cytotoxicity to off-target effects. To combat the aforementioned challenges with CRISPR/Cas9, we attempted to replicate a breakthrough protocol that delivered Cas9 ribonucleoproteins (RNPs) and used a one-step targeted mutagenesis on the model algal strain *Chlamydomonas reinhardtii.*
Methods: Instead of developing a plasmid vector encoding Cas9 and guide RNAs, the Cas9 and small guide RNA (sgRNA) were introduced to the algal strains during transformation/electroporation, along with a plasmid conferring zeocin resistance. The specific genes targeted by the sgRNA were *ChlM* and *CpFTSY,* which are responsible for chlorophyll synthesis and antenna size of the photosystem, respectively. The transformed algae was placed under low-light and grown for a 2-week duration.
Results: After transformation via electroporation, some of the transformed algal colonies were qualitatively less pigmented. However, the transformation efficiency for lighter colonies was significantly below 1%. Due to difficulties with PCR, gene knockout and plasmid integration has not been verified.
Statement of Conclusions: This application of the CRISPR/Cas9 genomic editing system on the model algae strain *Chlamydomonas reinhardtii* is still ongoing. It is unclear if this breakthrough protocol provides a reasonable path for transformation, but it is still promising in its theoretical approach. Future PCR verification will determine if CRISPR/Cas9 can reliably manipulate the algal genome.

Education

Abstract #6: PARENT PERCEPTION OF INVOLVEMENT WITH PRESCHOOL-AGED CHILDREN ON THE PLAYGROUND

Mrs. Samantha Evans - University of Oklahoma

Introduction: Planned behavior theory suggests that a parent's perception is based on behavioral, normative, and control beliefs that contribute to the expectations she has for herself and other parents. This expectation of how to act as a parent will alter their self-efficacy depending on how the parent views her level of involvement and if she believes they are a positive influence in the child's life. The level of self-efficacy a parent has will determine how involved the parent is with her preschool-aged child while on the playground. The purpose of this study is to see how parents involve themselves at a child centered playground with their preschool age child and how they perceive their involvement.
Methods: This phenomenology qualitative study consisted of 4 interviews (2 participants) and a focus group of 5 participants. Data analysis included descriptive, emotional, and in vivo coding to organize data into reoccurring themes.
Results: Results indicated that parent involvement fit two major categories including a hands-on approach and a second approach that values independent learning. Parent behaviors such as enticing and initiating activities were found to be perceived as being highly involved for both approaches. Parents used comments such as "being present," "interacting with them," and "the one initiating" to describe what it means to be an involved parent. This indicates an association with self-efficacy and a perception of high involvement with both approaches in parents of preschool-aged children.
Discussion: In both approaches, parents use enticing words to encourage their preschool-aged child. Parents may perceive themselves to be highly involved when they believe that allowing the child to be an independent explorer is an effective way of learning. Fostering independence is a common theme believed to be a life skill taught by the parents. At the same time, a mother might perceive herself to be a highly involved parent when she is next to her child's side helping her with every move. The two approaches seen in this study support self-efficacy theory and planned-behavior theory. The more actively involved the parent was with the activity the child was doing, the more interested the child was in doing the activity. Not only did it increase the child's interest, but also the enjoyment the child was having.

Abstract #12: APPROACHES TO LEARNING AS A MEDIATOR OF INHIBITORY CONTROL AND ACADEMIC ACHIEVEMENT

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Dr. Shinyoung Jeon - Early Childhood Research Institute
Dr. Kyong-Ah Kwon - University of Oklahoma

Introduction: Inhibitory control (IC) and approaches to learning (ATL) are two key domain-general constructs that develop rapidly in early childhood and support academic achievement (Pancheco, Owen & Caughy, 2018). IC helps children maintain attention and engage in goal-directed tasks. ATL refers to a constellation of classroom-based behaviors, such as motivation and persistence (Fantuzzo, McWayne, Perry, & Childs, 2004). As children enter kindergarten, ATL may mediate the relationship between IC and academic outcomes by supporting children's active engagement in learning situations (Sung & Wickrama, 2018). Research on the mediational role of ATL is limited and provides equivocal findings (Bohnlmann & Downer, 2016). However, given that gaps emerge in academic achievement as early as preschool, it is critical to understand ATL's potential role in academic achievement (Harvey & Miller, 2016). Thus, this study investigated how the initial level of and growth in IC are associated with ATL and academic outcomes in a sample of Head Start (HS) children.
Method: Using the Age 4 cohort from the Head Start Family and Child Experiences Survey 2009 (FACES 2009), latent growth curve analysis was utilized in a structural equation framework to examine how initial levels and growth of IC from HS to Kindergarten were associated with children's academic outcomes in Kindergarten. IC was assessed via pencil tap task, while ATL was measured through teacher-report. Children's math scores were obtained using item response theory from the Woodcock Johnson Applied Problems and the ECLS-B Math, while the standardized score of the PPVT was utilized for literacy.
Results and Discussion: IC showed significant linear growth (b= 4.07, p<.001) from Head Start to Kindergarten. Results showed that both intercept and slope of IC predicted children's ATL, literacy, and math scores in Kindergarten. In addition, kindergarten ATL was significantly positively associated with math, but not literacy outcomes, suggesting that ATL may mediate associations between the intercept and slope of IC and academic outcomes for math (Indirect effect: 95% CI = .05 - .20; 95% CI = .10 -.45). IC and its growth may account for math achievement more so than reading achievement in Kindergarten (Sung & Wickrama, 2018). This study provides evidence that both IC and ATL make unique contributions to children's academic achievement. It is important for teachers in early childhood to consider how to best nurture both capacities, especially for low-income children, so that they will be ready to learn and grow in Kindergarten (Pancheco et al., 2018).

Abstract #14: TRAUMATIZED RESIDENTS - IT'S NOT SURGERY. IT'S MEDICINE.

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Dr. Theresa Jackson - University of Oklahoma Health Sciences Center
Dr. Zhamak Khorgami - University of Oklahoma Health Sciences Center
Ms. Diane Jackson - University of Oklahoma Health Sciences Center
Dr. Vaidehi Agrawal - Johns Hopkins Bloomberg School of Public Health
Dr. Kevin Taubman - University of Oklahoma Health Sciences Center
Dr. Peter Nelson - University of Oklahoma Health Sciences Center
Dr. Michael Truitt - Methodist Health System Dallas

Purpose: Post-traumatic stress disorder (PTSD) has been shown to be elevated in surgical residents. This may be due to the rigors of a surgical residency that include long days and nights while caring for high acuity patients and learning when and how to operate. This study aims to compare the prevalence of screening positive for PTSD (PTSD+) between seven medical specialties to determine if surgical training leads to increased susceptibility for PTSD. Further, we intend to assess potential modifiable and non-modifiable risk factors for PTSD+.

Methods: A cross-sectional national survey of residents (n=1,904) was conducted from September 2016 to May 2017. Residents were screened for PTSD. Multivariate regression analysis for PTSD+ was assessed against thirty-one demographic, occupational, psychological, wellness, and work-environment variables.

Results: Residents from anesthesiology (n=180), emergency medicine (n=222), internal medicine (n=473), general surgery (n=464), obstetrics and gynecology (n=226), psychiatry (n=208), and surgical subspecialties (n=131) were surveyed. Prevalence of PTSD+ among surgical residents was 19%. No statistical difference was found in prevalence of PTSD+ between specialties (p=0.271). Prevalence ranged from 14% among emergency medicine residents to 23% in obstetrics and gynecology residents. Stepwise logistic regression was used with backward elimination. Nine independent predictors of PTSD+ were found: female gender, higher postgraduate year, public embarrassment, emotional exhaustion, feeling unhealthy, job dissatisfaction, hostile hospital culture, unsafe patient load, and unhappiness with career choice.

Conclusion: Prevalence of PTSD+ was not elevated among surgical residents as compared to other medical specialties. However, overall prevalence of PTSD (19%) remains more than three times that of the general population. Interventions to improve resident wellness and prevent PTSD is an important factor in the professional development of young surgeons.

Abstract #19: BUILDING KNOWLEDGE IN EARLY CHILDHOOD EDUCATION: STRATEGIES FOR ELEMENETARY PRINCIPALS

Mrs. Barbara Jones - OU-Tulsa

The percentage of preschool children enrolled in state programs continues to rise. Since 2004, enrollment of four-year-old's attending preschool has increased from 14 to 32 percent (NIEER, 2016). As access to state-funded preschools continues to increase, a steady rise in the number of preschool children enrolled in public education has been seen across the United States. Through the increase in preschoolers in public education comes an increase in the scope of responsibilities for elementary principals. Along with this tremendous responsibility, it is important for principals to possess background knowledge, education, and experience with preschoolers so they can effectively recognize and support quality early childhood programs within their schools. Elementary principals' influence is a significant factor in the success of their school, but more importantly in the success of each student under their direct supervision and leadership (National Research Council, 2015).

The purpose of this qualitative study was to explore what principals know and are able to do to support high-quality early childhood programs in their schools. Elementary principals and kindergarten teachers' capacity to reflect on and examine lived experiences, as well as their own practices in the context of early childhood education was explored through a hermeneutic phenomenological research study. This study utilized focus groups, interviews, and a field notebook to gather qualitative data. Participants included 50 certified kindergarten teachers and 11 elementary principals from 17 school districts in Oklahoma. Participants volunteered to participate in this study as a part of a larger feasibility study conducted by Oklahoma Partnership for School Readiness.

Abstract #24: MEDICAL STUDENT OR PREPARATION IN 2018: WHERE ARE WE?

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Dr. Charles Welch - University of Oklahoma--Tulsa
Dr. Zhamak Khorgami - University of Oklahoma Health Sciences Center
Dr. Geoffrey Chow - University of Oklahoma--Tulsa

Purpose: Each year, medical students and physician assistant (PA) students participate in surgery clerkships and are expected to attend and be prepared for operating room (OR) cases. There is limited data evaluating student preparation for the OR. Here, we examine student perceptions regarding OR preparation.
Methods: Medical and PA students at one institution were surveyed using a 7-point Likert Scale to evaluate perceptions of OR preparation. Survey questions assessed student perceptions of preparedness for various aspects of surgical procedures, how much time was spent in preparation, resources used, and if they perceived their preparation as helpful.
Results: Response rate for the survey was 49% (n=95). Students felt that they were prepared to discuss indications and contraindications (73%), relevant anatomy (86%), complications related to the procedure (70%), and their preparation was helpful (69%). Students felt unprepared to discuss the necessary steps of the procedure (31%). Students spent a mean of 28 minutes (SD: 16) preparing for cases. Students used a wide variety of sources, citing UpToDate and online videos as the most commonly used resources (74%; 73%).
Discussion: Students reported feeling prepared for surgical cases in the OR, but the majority of those surveyed felt unprepared to discuss the major steps of common cases. Additionally, we found that today's students are significantly less likely to utilize traditional study tools, such as textbooks. A majority of the students included in this study intended to enter a non-procedural specialty and procedural steps may not be viewed as important for their education. An alternative explanation is that the steps of procedures are not overtly taught whereas students have had direct instruction on anatomy and pathophysiology. Knowing the required steps of a procedure allows students to better participate in the OR and informs potential complications. Future resources for students might include an interactive, digital, easily accessible format with a focus on the required surgical steps of common procedures, while reinforcing complementary knowledge.

Abstract #25: MEDICAL STUDENT OR PREPARATION: DOES INTENDED SPECIALTY MATTER?

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Dr. Zhamak Khorgami - University of Oklahoma Health Sciences Center
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Purpose: Each year, medical students and physician assistant (PA) students participate in surgery clerkships and are expected to attend and be prepared for operating room (OR) cases. There is limited data comparing perceptions of preparedness for surgical procedures between students intending to enter procedural specialties and those entering non-procedural specialties. In this study, we examine the differences between intended specialty and the perception of preparedness for surgical cases.
Methods: Medical and PA students at one institution were surveyed using a 7-point Likert Scale to evaluate perceptions of OR preparation. Survey questions assessed student perceptions of preparedness for various aspects of surgical procedures, how much time was spent in preparation, resources used, and if they perceived their preparation as helpful.
Results: Response rate for the survey was 49% (n=95). Students planning to enter procedural specialties versus non-procedural specialties reported similar rates of being prepared to discuss relevant anatomy (91%, 83%, p-value 0.357), indications and contraindications (80%, 67%, p-value 0.184), procedural steps (40%, 26%, p-value 0.154), and complications of surgical cases (77%, 66%, p-value 0.236). Students planning to enter procedural specialties perceived that their preparation for surgical cases was more helpful (procedural 83%, non-procedural 60%, p-value 0.023), were more likely to use Up-To-Date (85%, 57%, p-value 0.004), and surgical atlases (57%, 29%, p-value 0.008) than their non-procedural counterparts, but less likely to rely on online videos (56%, 86%, p-value 0.027).
Discussion: Students entering procedural specialties feel similarly prepared for cases than their counterparts, with a trend towards feeling more prepared. There is a significant difference between the cohorts in their perception of the helpfulness of their preparation for cases and when comparing what type of resources the students used. This finding has implications for surgical educators and training programs as medical students today increasingly use non-traditional educational resources. This study suggests that medical student career aspirations affect which resources a particular student chooses for preparation.

Abstract #29: SYSTEMATIC REVIEW: AMBULATORY POINT-OF-CARE ULTRASOUND CURRICULA IN PRIMARY CARE RESIDENCY EDUCATION

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Dr. Brent Beasley - University of Oklahoma--Tulsa
Prof. Katie Prentice - University of Oklahoma--Tulsa
Dr. Jabraan Pasha - OU-Tulsa
Dr. Rui Mao - University of Oklahoma--Tulsa
Dr. Shannon Gwin - University of Oklahoma--Tulsa
Dr. Shahnawaz Ijaz - University of Oklahoma--Tulsa

Background: Point of care ultrasound (POCUS) has well established value in obstetrics, emergency medicine, and hospital-based procedures. However, utilization of POCUS in the outpatient setting by primary-care practitioners is not commonplace. With primary care residencies (internal medicine, family medicine, and pediatrics) increasingly implementing structured ultrasound curricula, we wanted to determine 1) what POCUS competencies can enhance the diagnostic and therapeutic ability of primary care residency graduates in ambulatory practice, 2) what POCUS curricula are available for primary care residency, and 3) if primary care residency alumni trained with POCUS curricula utilize POCUS routinely after graduation.
Methods: Following search strategies outlined by an inpatient POCUS review (http://www.crd.york.ac.uk/PROSPEROFILES/38302_STRATEGY_20160326.pdf) we performed a literature search with keywords “point of care ultrasound” and “internal medicine” “family medicine” “pediatrics” “primary care” and “residency” in combination with apply and replace thesaurus terms using the following databases: MEDLINE via PubMed, EMBASE via OVID, CINAHL via Ebsco, Web of Science, and Cochrane Central Register of Controlled Trials (CENTRAL). Two independent researchers reviewed each article to determine its inclusion in our review using the following criteria: (1) A published full-text paper must be available. (2) The paper must contain original data. (3) The paper must describe curricular training in use of POCUS among primary care residents (family medicine, pediatrics, and internal medicine). (4) The POCUS curricula must be completed by primary care residents in training. (5) The paper must describe ultrasound with an image for the clinician to view. Excluded were: (1) Papers regarding referral for ultrasound examination (2) Papers describing ultrasound as thermal therapeutic ultrasound (3) Papers describing ultrasound without production of an image for the clinician. (4) Papers not based on a medical education study of primary care residents. (5) Papers not published in English. (6) Papers focused solely on inpatient/hospital medicine. We analyzed the resultant articles using a standard template.
Results: The defined search criteria resulted in 391 articles. By applying the inclusion and exclusion criteria, we selected 33 of the 391 articles for further review. The resultant articles overall lack uniformity in assessed outcomes and externally verified tools within study methodologies; however, provide some take away points for adoption of an ambulatory POCUS curriculum.
Conclusion: POCUS in the ambulatory/outpatient setting appears to be in its infancy. Standardization in research surrounding outpatient POCUS utility, financial viability, and outcome review process for POCUS curriculum trials is limited.

Abstract #34: AN EXPLORATION OF ACCULTURATION STRATEGIES USED AMONG ZOMI YOUTH

Ms. Raeanne Ross - University of Oklahoma – Tulsa

Background: In the past decade, South Asian's have become the fastest growing immigrant population with more than 4 million Indian-origin Asians living in the United States (Lopez, Ruiz, & Patten, 2017). These immigrants are involved in cultural transitions and must find strategies to cope with new societal-cultural pressures and standards. Acculturation is used to define this process of negotiation and encompasses the strategies individuals use to integrate themselves into the new culture. Previous research on acculturation has typically focused on Asian immigrants as a homogenous group, when in fact Asians are very diverse in language, origin, culture, and immigration experience (Yeh et al., 2005). Furthermore, the *model-minority* stereotype has influenced the lack of research on this subgroup. The purpose of this qualitative phenomenological study was to explore the different acculturation strategies (assimilation, separation, integration, or marginalization) used among Zomi immigrant youth using Berry's Model of Acculturation (1997).

Methods: The participants included four Zomi immigrants from a public Midwest elementary school. Inclusion into the study included Non-English Speaking (NEP) students with a home language of Zomi. Two fourth grade students participated in a 20-minute one-on-one interview. Two second grade students were observed in a 30-minute play session.

Results: Tiered coding was used to analyze the observations and interviews. Overall, assimilation (37) was the most common strategy used for acculturation followed by integration (30), marginalization (17), and separation (25). Findings from the study indicate a constant negotiation across environments (home or school) and contexts (peer relationships, communication, academic success). Shifts in identity and strategy use occurred due to different values and norms found within each environment. Results from the study also revealed how participants changed their behavior or language use among peers dependent upon the purpose or social environment they were in.

Conclusion: An overall analysis reveals the participants preferred to adopt the new culture, while rejecting their home culture. Further examination of the context of strategy use was linked to the environment. Assimilation was typically found within the classroom environment, while separation was found within the home and play environment. Integration was not only influenced by the environment, but also by the participant's purpose (i.e. peer relations, identity, family). Marginalization was also more apparent in the participants who were younger with less time in the U.S. A common denominator between all participant's was their reliance upon peer relations and support systems during the acculturation process.

Abstract #37: EXPERIENTIAL LEARNING TO TEACH RESIDENTS ABOUT SOCIAL DETERMINANTS OF HEALTH

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Dr. Syeachia Dennis - OUSCM
Ms. Janet Gaskins - OUSCM

Background: Social determinants of health, the conditions where people live and work, have a significant impact on health outcomes. Integrating understanding of the social determinants of health is important for primary care providers, but this has not traditionally been a part of medical training. The ACGME, the accrediting body for residency programs, acknowledges the importance of teaching the social determinants, but reports deficiencies in residency program training in this area. No standard method to teach this topic exists. The purpose of this project was to use experiential learning, where learners participate in an activity and reflect back, to teach residents about social determinants, starting with transportation. Transportation method and access can impact health through missed appointments as well as decreasing leisure time, especially in a city like Tulsa with poorly developed public transportation

Methods: An experiential learning exercise about the effects of transportation access on health that included navigation of the bus system, discussion, and online reflection was implemented with a group of residents (n=6) and medical students (n=7) as part of the community medicine rotation. A questionnaire that assessed knowledge about and attitudes towards transportation impacts on health using a five-point Likert scale was developed to evaluate the exercise. Descriptive statistics were calculated for pre- and post- exercise questionnaires. Qualitative analysis of discussion and online reflections was also conducted.

Results: After the exercise, participants were more likely to report that they were familiar with transportation-related barriers that their patients may face, with 69.2% reporting agree/strongly agree on pre-questionnaire and 100% reporting agree/strongly agree on post-questionnaire. Participants were also more likely to report confidence in evaluating patients' transportation needs, with 30.8% reporting agree/strongly agree in the pre-questionnaire and 66.7% reporting agree/strongly agree in the post-questionnaire. Common themes of discussion and reflection included benefits of using the bus, inconvenience of the bus system, time trade-offs associated with bus travel, and possible solutions by health systems.

Conclusion: The exercise successfully stimulated discussion about the impacts of transportation on health. Experiential learning is an effective method to stimulate discussion and change attitudes about social determinants of health among family medicine residents.

Abstract #38: RESIDENT-LED EHR TRAINING IN AN ACADEMIC AMBULATORY CLINIC

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Dr. Jacob Murray - OU-Tulsa
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Ms. Kristin Rodriguez - OU-TU School of Community Medicine

Background: Despite the widespread use of electronic health records (EHR), medical trainees continue to struggle with effectively navigating these systems. Evidence shows that the usual classroom training is insufficient for new EHR users, yet we found no studies that have evaluated or disseminated the effectiveness of alternative training methods. Consequently, we developed a comprehensive, "hands-on" training course for the incoming PGY1 residents with the aim of improving the competency and efficiency of their use with our EHR system.
Methods: Each year, incoming interns participate in a 4-hour classroom EHR training taught by the on-campus EHR specialist during their orientation week. Participants included all PGY1 Internal Medicine residents (n=12). After completion of the conventional training, an independent faculty member administered an assessment to evaluate the interns' understanding and utilization of basic functions of Centricity EHR. From these results, we identified common problem areas and deficiencies that required correction. We designed a comprehensive resident-led training that included placing orders, e-prescribing medications, reviewing labs and test results, etc. The training was delivered during the first week of +1 ambulatory block by PGY2 and PGY3 residents (n=18) and consisted of a one-hour noon session from Monday to Thursday for a total of four sessions. At the conclusion of the training, the interns completed a post-assessment administered by an independent faculty member.
Results: Twelve PGY-1 residents were evaluated using a 13-item workflow skills assessment tool. The assessment required the intern to demonstrate each function/skill in real-time with each skill graded based on the ability to complete tasks independently, with assistance, or needing additional training. Before the training, 27.9% of interns were able to perform basic EHR tasks independently. After the training, 90.5% of participants achieved competency. The overall difference between pre- and post-tests was statistically significant ($p<.001$).
Conclusion: While EHR systems are becoming a necessity in all clinics, training, specifically for residents, remains subpar. We demonstrated that conventional EHR training is insufficient and that resident-based training has a significant impact on the effective utilization of EHR in every day clinical situations.

Abstract #75: TOBACCO AND ALCOHOL USE, RISK PERCEPTIONS, AND COUNSELING KNOWLEDGE AND CONFIDENCE AMONG MEDICAL TRAINEES

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Dr. Mary Williams - University of Oklahoma Health Sciences Center
Dr. Krista Kezbers – OU-TU School of Community Medicine
Dr. Marianna Wetherill - University of Oklahoma Health Sciences Center

Background: Tobacco and alcohol are among the leading causes of preventable death in Oklahoma, contributing to 8,856 deaths annually. Research from 2015 and 2008 showed US medical (MD) schools do not consistently prepare students to provide tobacco and alcohol counseling, respectively. Additionally, a provider's willingness to counsel patients may be influenced by many factors, such as personal health habits, healthy role modeling attitudes, as well as counseling knowledge and confidence. The primary aim of this study was to describe tobacco and alcohol-related perceptions among MD and physician assistant (PA) students, as well as their attitudes, knowledge, and confidence to counsel patients in these areas.
Methods: We administered a standardized electronic survey to MD and PA students (n=104). Standardized questions assessed smoking and alcohol use, and perceived risk of tobacco products. Additionally, attitudes, knowledge, and confidence towards tobacco cessation and alcohol counseling in routine practice were assessed using 5-point Likert scales. Statistical analyses were conducted in SPSS, version 24, including descriptive statistics and chi square analyses comparing risk perceptions between tobacco users vs. non-users and attitudes, confidence and knowledge between clinical and non-clinical students.
Results: Most respondents (93.3%) reported never smoking cigarettes; however, more than one-quarter reported ever smoking hookah (30.4%) or cigars (26.0%). The majority of respondents (84.6%) reported using alcohol in the past 12 months. While nearly all respondents (96.0%) perceived cigarettes as having "great risk", fewer perceived cigars (69.3%), e-cigarettes (60.8%), hookah (52.0%), and vapes (50.3%) as "great risk". Students with a history of tobacco use were less likely to perceive tobacco products as "great risk". Hookah and cigar users were less likely to strongly agree that patients expect providers to positively role model healthy behaviors, such as non-smoking. No significant differences were found between clinical and non-clinical students' perceptions of tobacco cessation and alcohol counseling relevance; however, more clinical students reported knowledge and confidence in assessing smoking and alcohol behaviors.
Conclusion: The lower smoking prevalence among MD and PA students and higher "ever use" of other tobacco products was similar to reported observations in other college-educated populations. Reported alcohol use was similar to rates reported for other MD student populations. To change misperceptions of risk and to increase MD and PA students' knowledge and confidence to address all tobacco and alcohol issues, educational curricula should be enhanced to discuss the health risks associated with all forms of tobacco.

Abstract #76: LANGUAGE PROFICIENCY AND EXECUTIVE FUNCTION IN SPANISH-SPEAKING DUAL LANGUAGE LEARNERS

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Ms. Sherri Castle - OU-Tulsa

Given that twenty-three percent of children enrolled in public pre-k programs across the U.S. are dual language learners (DLLs) (NIEER, 2017), further research is needed on diversity within the population of DLLs regarding the range of language skills that children bring to early school experiences.
Research has shown that bilingual children have higher performance and faster growth than their monolingual peers in some domains of executive function (EF), such as inhibitory control (Bialystok et al., 2005; Santillán & Khurana, 2018). The current study examined different patterns of language skills among Spanish home language DLLs and investigated whether these differences impacted multiple domains of EF.
Participants were selected from a broader longitudinal study that is following children from three years old to fourth grade. The study sample included 378 DLLs with Spanish as a home language who attended a four-year-old pre-k program. The present study employed a Latent Profile Analysis (LPA) using M*plus* 8.1 to detect an underlying latent categorical variable which demonstrates sub-groups of DLLs given the profiles of their English and Spanish skills. Further, we used a 3-step approach, (BCH method), to examine whether EF skills differ by the profiled groups.
English and Spanish language skills were measured through direct assessment using the Clinical Evaluation of Language Fundamentals – Preschool 2 (Semel, Wiig & Secord, 2004; Wiig, Secord & Semel, 2009).Three domains of executive function were measured by the EF Touch (Willoughby et al., 2010), including working memory, inhibitory control and cognitive flexibility.
Four classes (i.e., sub-groups) of DLLs were found, indicating: 1) low English and Spanish skills (26%) 2) average English and low Spanish skills (27%) 3) low English and high Spanish skills (26%) and 4) high English skills and above-average Spanish skills (21%). These findings support the evidence of heterogeneity of DLLs demonstrated in recent studies. The four classes showed significant differences in three EF domains. The class representing proficiency in both languages demonstrated higher cognitive flexibility than the other three sub-groups. The class representing low language skills in both English and Spanish showed less development in all domains of EF skills than the other three groups. These results are consistent with other studies that have shown positive impacts of bilingualism on EF skills. Further description of differences among DLL sub-groups is needed, with particular attention to children with low skills across languages who may be at higher risk for low EF than their DLL peers.

Abstract #84: AN MSW COURSE ON PRACTICE WITH SEXUAL AND GENDER MINORITY CLIENTS

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Mx. Eden Nay - University of Oklahoma--Tulsa
Dr. Jedediah Bragg - University of Oklahoma--Tulsa
Dr. Julie Miller Cribbs - University of Oklahoma--Tulsa
Mr. Ric Munoz - University of Oklahoma--Tulsa
Ms. Jessica Stanley - University of Oklahoma--Tulsa

Background: A growing body of research has shown that many graduate, clinical and mental health programs fail to sufficiently prepare students to competently work with sexual and gender minority (SGM) populations, leading to deficiencies in social service delivery. Consequently, many national accrediting bodies such as the Counsel of Social Work Education have begun to call for more inclusive measures within graduate education curricula. SGM populations have endured countless years of oppression and violence. Not only are they a particularly vulnerable population, but also a more numerous portion of social service clientele than some professionals might suspect—meaning that virtually all mental health professionals will serve SGM clients, regardless of field. In order to create a more inclusive community, knowledge regarding these populations were compiled into an elective course for graduate social work students within a Midwestern university's MSW program. Course content included an introduction to past and present issues confronting the SGM people and the application of ethical requirements regarding research, practice, and advocacy roles in Social Work.
Methods & Results: The course *Social Work with Sexual and Gender Minorities* was presented for two consecutive years. Assessment of the course was performed in two ways: (1) with a survey instrument given before the first day of class, just before the simulation assignment, and immediately after the simulation assignment and (2) at the end of the course using the university's course evaluations. Changes in students' self-reported levels of LGBT clinical skill development and general knowledge regarding practice with SGM populations were assessed using one-way repeated ANOVAs, revealing significant increases in both the clinical skill development and general knowledge variables. Content analysis of student responses to course evaluations revealed six themes: satisfaction with the course, recommending others take the course, acquisition of new information, importance of the information to practice, and the usefulness of the simulation assignment.
Conclusion: A specialized course, focusing on practice with SGM populations, can serve to expand curriculum inclusivity within the context of social work education. Social work, as a field, engages in an ongoing pursuit of social justice that requires social work education programs to utilize educational material relevant to the populations served. This study suggests that a course like *Social Work and Gender Minorities* is a successful method in which to prepare students for future practice with SGM clients.

Abstract #90: INFANT ATTACHMENT BEHAVIORS IN A CLASSROOM SETTING

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Introduction: Positive social and emotional skills, such as self-regulation, increase the likelihood that a child will perform well in school. The building blocks of these skills are taking shape by age two, however research now suggests that considering development of these skills at age two may be too late. In infancy, the development of self-regulation is embedded in a dyadic co-regulation with an attachment figure, typically the mother. But more infants now spend their days in a classroom-based setting, so attachment relationships may also form with a child care provider. We are understanding the importance of responsive and sensitive teachers to this attachment relationship, however, we have yet to examine thoroughly the infant behavior in the dyadic teacher-infant relationship, nor fully considered what infant behavior can tell us about highly responsive care or social and emotional development in the classroom. This qualitative pilot study seeks to examine the infant attachment behaviors in a classroom setting.

Methods: The sample includes one infant and two infant teachers. Both teachers work at local child development centers, and the infant had been in the classroom setting since 9 weeks old. Data collection included observations of the infant and interviews with each teacher. The observations followed a protocol where the researcher observed the infant's behavior such as how the infant displayed a need or the infant's response to stimulation or interaction. The interviews were to gain teacher perspective of their interpretation of infant behaviors in the classroom. A field notebook was used to collect observation, interview, and reflection notes. Observations and interviews were analyzed using cycle 1 and cycle 2 coding. Graphs were used for further analysis of emerging themes.

Results: Findings revealed the infant had a consistent behavior pattern that showed he had a need to socially and emotionally connect with his teachers prior to his exploration and learning. Behaviors such as smiling, gazing, and touching indicated attempts to initiate an interaction with his teachers. His bids for attention and his teachers responses to them, showed a building syncronicity and coregulation occurring within the relationship. His behavior pattern over time indicated that he was beginning to co-regulate with his teachers, which suggests the emergence of self-regulation skills.

Discussion: This pilot study serves as a foundation for continued examination of infant attachment behaviors in the classroom setting in order to gain a better understanding of, and to improve infant care, especially for very young infants.

Abstract #109: BUILDING A CULTURE OF HEALTH: HEALTHCARE STUDENT PERCEPTIONS OF LIFESTYLE MEDICINE

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Mrs. Gracen Davis - OU-TU School of Community Medicine
Dr. Krista Kezbers - OU-TU School of Community Medicine
Dr. Lori Whelan - OU-TU School of Community Medicine
Dr. Marianna Wetherill - OUHSC College of Public Health

Background: Chronic diseases are preventable, manageable, and, sometimes reversible, through healthy lifestyle change.Studies support that medical providers are more likely to counsel patients on lifestyle behaviors when they perform the behaviors themselves, and that patients are more receptive to lifestyle counseling when they perceive their providers role modelhealthy behaviors. Medical school curricula often do not prepare students to counsel about healthy lifestyles. Little is known about how medical and physician assistant (PA) students perceive the relevance of lifestyle counseling in future medical practice, and whether these attitudes vary by intended specialty.
Methods: We administered an electronic survey to medical and PA students (n=103). Standardized questions assessed attitudes toward preventive health counseling using a 5-point Likert scale. Additionally, perceived relevance of preventive health interventions as a component of future practice was assessed by intended specialty. We calculated descriptive statistics and Chi-square analyses were conducted to compare perceived relevance of health interventions in their future practice by intended specialty.
Results: Most respondents (84.5%) strongly agreed that providers have a responsibility to promote prevention with their patients; however, less than half (39.8%) strongly endorsed provider role modeling as an essential part of effective counseling. Fewer students (17.5%) strongly agreed that patients will adopt a healthier lifestyle if counseled to do so. Additionally, a minority strongly agreed that their classmates provide peer support to engage in healthy habits, including exercise (15.7%) and healthy diet (7.8%). Students intending to enter primary care were significantly more likely to perceive nutritional counseling (55.6% vs. 22.9%), weight management (74.1% vs. 31.4%), and physical activity counseling (63.0% vs. 31.4%) as highly relevant to future practice than students planning to enter a specialty, $p < 0.05$.
Conclusion: The role of nutrition and physical activity in shapinghealth outcomes is irrefutable. Our study found that a majority of medical/PA students believe it is their responsibility to promote prevention with their patients; however, the perceived relevance of lifestyle counseling varied by intended specialty. Fewer recognized the impact of provider role modeling on a patient's willingness to change behavior and less perceived that patients would change their behavior. Students described a peer environment that is not supportive of healthy habits. These factors point to multiple opportunities for medical schools to build a culture of health, including student wellness, provider role modeling, and education on the role of lifestyle in patient outcomes, regardless of specialty.

Abstract #114: IDENTIFYING MEDICAL RESIDENT KNOWLEDGE GAPS IN NUTRITION MANAGEMENT OF HYPERTENSION AND HYPERLIPIDEMIA

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Introduction: Hyperlipidemia and hypertension affect a significant portion of U.S. adults, 12.4% and 33.2% respectively. The value of diet in management for these conditions is under appreciated. For example, the Portfolio diet has been shown to be as effective as statins for lipid lowering. The DASH diet, which is low in sodium but high in calcium, magnesium, and potassium, has been shown to lower blood pressure as effectively as medication. Current US medical training inadequately prepares physicians to provide diet recommendations as first line therapy or concomitantly with prescription medications. Culinary medicine, an emerging field, provides medical trainees with tangible education on therapeutic diets. The purpose of this study is to describe knowledge gaps among OUSCM medical residents to inform the development of a culinary medicine training program.
Methods: Electronic surveys were administered to medical residents (total n=41) participating in family medicine (n=13), internal medicine (n=13), and emergency medicine (n=14) residency programs to assess nutrition knowledge specific to hypertension (5 items) and hyperlipidemia (8 items). Knowledge assessment questions were based on evidence-based clinical guidelines for nutrition therapy and were expert reviewed by an advanced-practice registered dietitian. We additionally assessed resident confidence to counsel patients in nutrition and the perceived importance of nutrition in treatment. Descriptive statistics were calculated using SPSS, Version 24.
Results: Few to no residents reported any history of formal nutrition education, including college minor or major (0%), college coursework (26.8%), or CME (2.4%). On average, residents only answered 3 of 5 hypertension test questions correctly (M=3.0 and SD=1.1). Although 87.8% could correctly identify the top US dietary sources of sodium, nearly one-third did not know the sodium guidelines for blood pressure management. Commonly missed items included dietary sources of potassium (46.3% incorrect), magnesium (51.2% incorrect) and calcium (61% incorrect). On average residents answered half of the hyperlipidemia questions correctly (M=4.2 and SD=1.4). Commonly missed questions included dietary sources of saturated fat (50% incorrect), good sources of omega-3 fatty acids (80% incorrect), and clinical guidelines for lowering LDL cholesterol though saturated and trans fat restrictions (75% incorrect). Most residents felt only slightly or somewhat knowledgeable (77.5%) advising patients on nutrition.
Discussion: This study identified key knowledge gaps among medical residents in dietary guidelines for hypertension and hyperlipidemia management. Residency training programs can be enhanced through innovative programs that teach nutrition concepts. These findings will be used to inform the development and evaluation of residency culinary medicine training programs.

Abstract #122: PARENTS', STUDENTS', AND TEACHERS' PERCEPTIONS OF OUT-OF-SCHOOL TIME (OST) PROGRAM OUTCOMES

Mrs. Laura Latta - OU-Tulsa

Introduction: The provision of out-of-school time (OST) programs is one approach to extending students' daily learning. Community schools aim to offer a variety of OST programs. Compared to the regular school day, these programs include smaller groups of students who enroll based on interest. One challenge associated with OST programs is identifying appropriate indicators of success. The purpose of this study was to use focus groups and interviews to identify outcomes that students, parents, and teachers perceived from participation in OST programs.

Methods: This qualitative phenomenological study was conducted in a Tulsa area, Title 1 community school where there are over twenty-eight 8-10 week OST programs available to students. The sample included first through fifth grade students (n= 118), parents (n=35), and OST program teachers (n= 28). Fifty-four percent of the students were female (n=64) and the students were 56% Latinx or Hispanic, 22% African American, 14% White, 6% Asian, 2% American Indian, and 1% Pacific Islander. Students and parents were randomly selected and assigned to focus groups based on student age and program content. Focus groups included questions about children's learning outcomes from their OST programs. Semi-structured interviews about program activities and student learning were conducted with all OST program teachers.

All focus groups and teacher interviews were recorded and transcribed. The transcriptions were coded using a start list of provisional codes and subsequently analyzed for topic themes. A second layer of coding analysis was applied to find overarching themes among all interviews and focus groups. Finally, a third level of selective coding analysis was used to develop the narrative of findings about perceived outcomes.

Results: Each of the three groups perceived different outcomes from student participation in OST programs. Teachers emphasized students' development of social and emotional process-based skills, while parents tended to focus more on content-specific learning with a peripheral emphasis on self-esteem and self-advocacy. Students focused heavily on the relational aspects of OST programs, explaining that the most important outcomes of OST programs were developing friendships and time to play. All groups mentioned the value of small class sizes, interest-based curriculum, and the value of multi-age groupings.

Discussion: Results support a triadic approach to OST programming which integrates content knowledge, process skills, and relationship development. All three components are vital to the success of OST programs and resultant student academic and engagement outcomes. Findings from the study are useful for OST program planning, evaluation, and improvement.

Engineering and Applied Research

Abstract #36: DEVELOPMENT AND CHARACTERIZATION OF PROMOTED CATALYSTS USED IN MDA

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Methane dehydroaromatization (MDA) is a popular method for direct conversion of methane to various aromatics using a bifunctional catalyst (Mo/HZSM-5). To improve its conversion and to reduce coking, several techniques were studied in literature, including the addition of promoters to the source catalyst. In this study, three different promoters, namely K, Rh, and Fe, were added to Mo/HZSM-5. Three sets were prepared for each promoter, with a loading of 0.5 wt%, 1.0 wt%, and 1.5 wt%, over the 10 wt% Mo-loaded HZSM-5 catalyst. Mo/HZSM-5 was prepared by incipient wetness impregnation method. K, Rh, and Fe-promoted Mo/HZSM-5 catalysts were prepared by sequential impregnation method. These fresh catalysts, as well as the spent catalysts (after the MDA process), were then characterized with Brunauer-Emmett-Teller (BET) surface area analysis, inductively coupled plasma-optical emission spectrometry (ICP-OES), X-ray diffraction (XRD), scanning electron microscopic analysis (SEM), temperature programmed reduction (TPR), temperature programmed oxidation (TPO), n-Propylamine-temperature programmed desorption (NPA-TBD), and CO-chemisorption. The characterization of all of the promoted metal catalysts were compared to that of the unpromoted Mo/HZSM-5. Finally, the surface properties, acidity, and the metal support interaction in terms of metal reduction as a function of temperature for the fresh catalysts and the carbon content of the spent catalysts were successfully studied.

Abstract #45: PLANNING AND OPTIMIZING NETWORKS OF THE FUTURE: QUANTIFICATION OF ERRORS IN AUTONOMOUS COVERAGE ESTIMATION USING MDT

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In conventional cellular networks, cell outage detection mechanisms incur inevitable delay and unreliability that stems from human error and low spatio temporal granularity of reports gathered via drive tests. In addition, these drive test based measurements are gathered from only a small fraction of the total coverage area, i.e., paved roads and are difficult to obtain in indoor environments. This problem is likely to aggravate with the advent of small cell enabled ultra-dense networks, where the probability of cell outages is expected to increase further. In order to solve these problems, minimization of drive test (MDT) allows coverage to be estimated at the base station using user equipment measurement reports with the objective of eliminating the need for drive tests. The user equipment measurement reports are tagged with their geographical location information, sent to their serving base station and ultimately used to generate coverage maps. This can enable network automation or self-organization which could enables the network to detect changes, such as detection of coverage holes, weak coverage, performance degradation problems and then based on these detected changes, make timely decisions. While far more efficient than drive tests, any MDT based solution for coverage estimation has to overcome the following major errors: user positioning error, quantization error and error due to data scarcity. We quantify various types of errors in MDT-based autonomous coverage estimation that stem from inaccurate user positioning, for example, as a result of positioning measurement uncertainties, quantization due to dividing the coverage area into bins and missing data due to sparse user density. By investigating the interplay between these errors, we show that there exists an optimal bin width for coverage estimation. We determine it as a function of positioning error and user density by using numerical methods. This analysis can be used for several practical applications, for example, this can enable cellular network operators to configure the bin size for given positioning accuracy that results in the most accurate MDT based coverage estimation and to calibrate coverage in order to estimate real coverage.

Abstract #53: HIGHLY LUMINESCENT LEAD DEPLETED Cs4PbBr6 CRYSTALS FOR WHITE LIGHT EMISSION

Mr. Gopi Adhikari - The University of Tulsa
Mr. Saroj Thapa - The University of Tulsa
Dr. Hongyang Zhu - The University of Tulsa
Dr. Peifen Zhu - The University of Tulsa

In this work, we have summarized the room temperature synthesis of blue emitting $CsPbBr_3$ and lead depleted green emitting Cs_4PbBr_6 crystals at an ambient atmosphere, and investigate the potential application of these crystals in white light emitting diodes. We observed that the cubic $CsPbBr_3$ nanoplatelets obtained at a low amount of Cs-oleate precursor completely transformed into the more stable and less toxic rhombohedral Cs_4PbBr_6 when the amount of precursor was subsequently increased. This work also offered an explanation for luminescent nature of lead depleted Cs_4PbBr_6 through optical and surface characterization. Furthermore, the desirable tunability of correlated color temperature from 2480 - 9134 K (warm - cool white light) maintaining the color rendering index (CRI) up to 96 can be obtained by combining these crystals with yellow and red emissive perovskites. To the best of our knowledge, this is the highest value of CRI yet reported for these type of materials. Hence, these experimental results suggest that these materials provide great advantages to be used for illumination purposes.

Abstract #54: ALL-INORGANIC MIXED HALIDE PEROVSKITES FOR WHITE LIGHT EMISSION

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Lead halide perovskites offer advantages to be used in the fabrication of various optoelectronic devices because of their remarkable optical properties. Herein, all-inorganic perovskite nanocrystals, $CsPb(Br_{1-x}I_x)_3$ [$0 \leq x < 1$], with tunable properties were synthesized at an ambient atmosphere employing a solution processed precipitation technique, adjusting the bromide-iodide composition. The peak emission wavelength was readily tuned over the entire visible spectrum ranging from 464-667 nm with a narrow-line width emission (23-47 nm). By combining the different conversion layers (blue, green, yellow, and red) of these nanocrystals with UV light-emitting diodes (LEDs), we observed the white light with a tunable correlated color temperature (CCT, 2513-9783 K) and a color rendering index (CRI) optimized up to 95. Thus, the experimental results suggest that the solution processed nanocrystals obtained in this work can be used for future indoor lighting devices.

Abstract #57: EFFECTS OF BUFFER CONCENTRATION AND TEMPERATURE ON HYDROLYSIS OF L-ARGININE ETHYL ESTER

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Mr. Alex Beffa - University of Tulsa
Ms. Madison Reavis - University of Tulsa
Dr. Gordon Purser - University of Tulsa

L-arginine is a sports supplement commonly used by athletes to enhance performance and endurance. L-arginine ethyl ester (LAEE) is a derivative of l-arginine taken with claims that the ester form has a greater efficacy, leading to lower doses required. LAEE hydrolyses into l-arginine and ethanol in the various conditions of the body. The hydrolysis of LAEE is dependent on pH value, temperature, and buffer concentration. A study of the effects of the buffer concentration and temperature was performed using NMR analysis. The results of these effects on the hydrolysis of LAEE are reported. An analysis of the effects of temperature, where a temperature dependency was measured at pH values 1.0, 2.6, 6.5, and 11.8, shows a direct relationship between the temperature and the rate of hydrolysis. Activation parameters were determined and the enthalpy and entropy were calculated using an Eyring plot for each pH value. The enthalpy of activation is 64 $kJ \cdot mol^{-1}$ at pH 1.0, 74 $kJ \cdot mol^{-1}$ at pH 2.6, 68 $kJ \cdot mol^{-1}$ at pH 6.6, and 73 $kJ \cdot mol^{-1}$ at pH 11.0. The entropy of activation is -161 $J \cdot K^{-1} \cdot mol^{-1}$ at pH 1.0, -136 $J \cdot K^{-1} \cdot mol^{-1}$ at pH 2.6, -113 $J \cdot K^{-1} \cdot mol^{-1}$ at pH 6.6, and -58 $J \cdot K^{-1} \cdot mol^{-1}$ at pH 11.0. Phosphate experiments, where buffer concentration was varied while pH values were kept constant, were performed at pH values of 2.0, 6.5, and 11.8. The rate of the hydrolysis reaction increases as the buffer concentration increases confirming a first order phosphate dependence.

Abstract #79: DYNAMIC AREA SEARCH WITH SHARED MEMORY A META FRAMEWORK TO IMPROVE PATHFINDING ALGORITHMS

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Finding the shortest path between two given objects/states is a common problem for many scenarios/applications. Although many algorithms have been proposed, most of them rely entirely on the heuristic metrics to guide the search for the optimal path. In this work, we proposed a novel and generic approach to learn the underlying structure of the environment while exploring the problem seamlessly. The approach, Dynamic Area Search with Shared Memory (**DASSM**), learns from already explored areas in the pathfinding problem and efficiently and dynamically reuse the information to guide the utilized pathfinding algorithms. We showed how **DASSM** can alleviate the computational overhead by limiting and focusing the search to regions that more likely have the optimal path based on the learned information. In addition, we elaborated on the implementation and technical details of the approach and revealed its feasibility to be implemented to a wide range of informed search algorithms. To test **DASSM**, we applied it for three common pathfinding algorithms and tested them on publicly available benchmarks. **DASSM** improved the performance in all cases and reduced the execution time up to **75%**. Moreover, we examined adding random steps for **DASSM**, where the results revealed a potential improvement in the execution time.

Abstract #99: PROPOSED MECHANISM AND RATE LAW FOR THE NON-ENZYMATIC HYDROLYSIS OF L-ARGININE ETHYL ESTER

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Ms. Payten Harville - Univer
Dr. Gordon Purser - University of Tulsa

L-Arginine (LA) is commonly used as a workout supplement to increase athletic stamina and ability. The low oral bioavailability of LA has led to the synthesis of new molecules such as l-arginine ethyl ester (LAEE). LAEE is argued to have a higher bioavailability than LA because of an increase in hydrophobic properties. The kinetic mechanism of the non-enzymatic hydrolysis of LAEE, with a specific emphasis on the physiological pH conditions found in the body (2.5, 8.1, and 7.4), is the subject of this study. Apparent rate constants were measured by performing rate experiments under pseudo-first order reaction conditions using a phosphate buffer. From this data, a proposed rate law for the non-enzymatic hydrolysis of LAEE is proposed over the pH range of 0.5-12.9. The proposed rate law of the hydrolysis is Rate = $k_1[H_3O^+][LAEE^{2+}]+k_2[LAEE^{2+}]+k_3[H_2PO_4^-][LAEE^{2+}]+k_4[HPO_4^{2-}][LAEE^{2+}]+k_5[PO_4^{3-}][LAEE^{2+}]+k_6[OH^-][LAEE^{2+}]+k_7[LAEE]+k_8[H_2PO_4^-][LAEE]+k_9[HPO_4^{2-}][LAEE]+k_{10}[PO_4^{3-}][LAEE]+k_{11}[OH^-][LAEE]$. The calculated rate constants ($M^{-1}s^{-1}$) are $k_1=2x10^{-7}$, $k_2=5x10^{-9}$, $k_3=1x10^{-7}$, $k_4=3x10^{-5}$, $k_5=0$ to 1, $k_6=8x10^{1}$, $k_7=3x10^{-4}$, $k_8=0$ to 1, $k_9=1x10^{-4}$, $k_{10}=1x10^{-3}$, and $k_{11}=1x10^{-3}$. Conclusion: There is a phosphate dependency at multiple pH values, and l-arginine ethyl ester is stable for long periods of time at physiological pH values.

Abstract #101: DETERMINING THE EFFECTS OF REACTION MEDIA ON ELECTRONICALLY MISMATCHED DIELS-ALDER REACTIONS

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Mr. Zhiguo Wang - The University of Tulsa

Background: The Diels-Alder (DA) reaction is among the most used organic reactions in synthetic organic chemistry. It enables the formation of cyclohexenes by reacting a diene with a dienophile. The majority of DA reactions have an electron rich reactant and an electron deficient reactant. In our research group we looked at electronically mismatched reactants, meaning that they both are electronically similar. DA reactions between electronically mismatched partners require high temperatures or the use of chemical oxidants, electricity, or photosensitizers and suffer from low yields or a limited substrate scope. We have found that the reaction can occur at room temperature without the use of any additives mentioned above. This study is aimed to understand the mechanism of this transformation.
Methods: We used anthole (1) and dimethly butadiene (2) as our electron rich diene and dienophile. We used a solvent system of varying molarities of lithium perchlorate (LPC) (3), varying amounts of water, and a constant amount of nitromethane (4). The reaction was ran for 12 hours at room temperature, then we checked the conversion of starting material to our desired product (5). The % conversions were checked using high performance liquid chromatography.
Results and Conclusions: We discovered that the addition of 0.2 mmols of water in our solvent system increased our percent conversion from 25% to 72%. Moving forward, we plan to see if this is due to decrease in the concentration of LPC, as LPC is known to make hydrates with water. Varying amounts of LPC concentrations also confirm this hypothesis as the ideal concentration of of LPC is 0.2 M LPC. More work is underway to understand how LPC is accelerating this reaction and why the reaction is LPC concentration dependent.

Abstract #111: COUPLING REACTION OF ETHYL DIAZOACETATE WITH A TERTIARY THIOAMIDE

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Introduction: Peripentonine A and B alkaloids have d-opioid receptor (DOR) affinity and they have not been synthesized. The DOR receptor activation reduces persistent pain and improves negative emotional states. Our research involved optimizing a copper-catalyzed coupling reaction of this tertiary thioamide **(1)** with ethyl diazoacetate **(2)** to yield an enaminone intermediate **(3)**. The optimized reactions conditions will be used in a similar coupling reaction to yield a key intermediate in the total synthesis of Peripentonine. Copper catalysts are more economical than Rh(II) or Ru(II) catalysts in these sorts of coupling reactions. Furthermore both Rh(II) and Ru(II) remain unsuccessful in our initial screening of the coupling of **(2)** with the 1-methylpyrrolidine-2-thione.
Methods: Five copper(I) catalysts were screened in a reaction of a teritary thioamide and ethyl diazoacetate in dichloroethane at 40^{o}C for 24 hours. The copper(I) catalysts screened were CuBr, CuI, Cu(CH3CN)4BF4, Cu(CH3CN)4PF6, and (CuOTf)2.Tol. The product was then purified using column chromatography, and the percent conversion to the enaminone intermediate was found using 1-H NMR spectroscopy.
Results: CuBr was found to be the most effective catalyst, yielding a 64% conversion of starting material to the intermediate product.
Conclusion: CuBr is an inexpensive catalyst that yields the greatest conversion to the target enaminone. CuBr is the most optimum catalyst in this coupling reaction, and this type of reaction is necessary to produce a key intermediate in the total synthesis of Peripentonine.

Abstract #113: STABILITY OF A VORTEX EQUILIBRIUM CONFIGURATION

Ms. Jennifer Burleson - The University of Tulsa

Vortex statics is an area of mathematical physics that is rife with potential discoveries and relevant due to its applications to fluid dynamics and other physical phenomena. There has been a considerable amount of studies devoted to developing numerical and analytical descriptions of the behavior of specific configurations. This study focuses on numerically interpreting an equilibrium configuration consisting of a positive vortex sheet and two negative point vortices symmetric about the real axis. Mathematica was used to determine the parameters of the configuration for which the total circulation was zero. The system was then modeled with a discrete number of points. Newton's method was used to converge on an equilibrium configuration. The effects of small perturbations to the system over time were investigated using Euler's method. The studied perturbations involved displacing the single point vortices and bending the vortex sheet. The resulting configurations were displayed graphically and characterized in terms of the level of deformity that resulted from the alterations to the system. The behavior of the system over time seems to indicate that it is unstable given that it disintegrates about two seconds after the perturbations are applied. It first begins with a distortion of the vortex sheet and eventually splits into two collections of point vortices before entirely dissolving. The stability of a configuration is significant because it will determine whether or not the system will persist in a fluid flow and be worthy of further study.

Abstract #115: AUTHENTICATING IN SAE J1939 WITH WATERMARKING

Mr. John Maag - The University of Tulsa
Dr. Jeremy Daily - The University of Tulsa

Background: Controller Area Network (CAN) environments in heavy vehicles largely follow the SAE J1939 standard. The standard CAN 2.0 data frame has a maximum size of eight bytes. In typical authentication on other networking schemes, there is more available bandwidth and frame space for cryptographically secure authentication. In addition, Heavy vehicles' increasing incorporation of technology has increased the overall frequency of CAN messages on the bus. With little available bandwidth for security and authentication, a solution that utilizes little additional bandwidth is required. Watermarking is an approach to authenticate nodes on a network given current CAN technology deployed in heavy vehicles currently in service with little additional bandwidth requirements. Watermarking is the act of superimposing information within data. In cryptography, watermarking is used to authenticate information by adding message authentication codes that only the sender and receiver, with a shared symmetric key, can validate. An implementation of watermarking SAE J1939 CAN messages using hardware accelerated security modules is presented.
Methods: The implementation utilizes NXP's s32k family of processors to provide hardware accelerated cryptographic message authentication codes (CMACs) as a means of authentication. The CMAC is generated using sent CAN data and watermarked within a suspect parameter number (SPN) defined by the J1939 standard but underutilized by manufactures' implementations. To date, similar implementations have been demonstrated with algorithms in software and networking occurring in CAN systems not utilizing the J1939 standard.
Results: A physical demonstration is presented, that implements the watermarking scheme. Upon normal operation, two NXP s32k evaluation boards share a symmetric key and can authenticate message traffic. A GUI accompanies the hardware to display real time CAN messages and synthesized wheel speed data. A switch introduces foreign CAN traffic and an indicator light displays that the receiving CAN node is unable to authenticate.
Conclusion: The design is intended as a potential authentication solution that is backwards compatible. It serves as a demonstrated example for use in new, commercial designs that are not yet implementing higher bandwidth communications.

Abstract #123: HEAVY VEHICLE CHIP LEVEL FORENSICS

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Introduction: Heavy vehicle historical data such as sudden deceleration reports show the vehicle speed, engine RPM, engine load, brake and clutch status from a hard-braking event is critical information for law enforcement to reconstruct crashes. This data is stored in the Engine Control Module (ECM) inside the truck and can be downloaded via the diagnostic port. However, in some cases, a crash damages electrical connections and data cannot be retrieved through standard procedures.
Methods: A method of physically removing the microchips from a damaged ECM and soldering them into to a new blank ECM has been implemented in some places, but it is time consuming and difficult due to how small and delicate the microchips are. The proposed method is to execute a virtual chip swap (cloning). The two devices that are used to operate the cloning process: Alien Tech K-TAG and PEmicro Cyclone. Both devices require the JTAG (Joint Test Action Group) ports for communication. K-TAG is more user-friendly with detailed, step by step instruction, but they do not describe the specific JTAG pin out for the chip and their service requires an annual subscription. On the other hand, PEmicro is open source but only useful for experienced users. However, the challenge is that some ECM have their JTAG pinout in non-standard form. To reverse engineer an identical ECM is obtained, and the microchips is removed for reverse engineering. The JTAG pins are eventually identified using continuity tests.
Furthermore, throughout the cloning process, the raw binary data of the ECM can be obtained through the devices. With the access to the binary data, the location of sudden deceleration in the binary data is found by creating a recognizable event in the ECM. Using the J1939 standard, the binary is converted to actual numbers for confirmation.
Results: The cloning process is successful using either the K-TAG or the PEmicro. The cloned ECM is verified to work normally, and the data is verified to be the same. The sudden deceleration location is found in the binary data through reverse engineering known events.
Conclusion: The results show there is a safer and more efficient way for law enforcement to recover crashed vehicle data. Moreover, the reverse engineering process can be applied to different ECM for future reference.

Social Behavioral

Abstract #7: IMPACT OF SLEEP HABITS ON QUALITY OF LIFE IN OBESE CHILDREN

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Background: Quality of life (QL) is decreased in children with obesity. The contribution of sleep habits to QL in these patients has not been thoroughly evaluated. This study hypothesized that different types of sleep habits would moderate quality of life in obese children.
Methods: This is a retrospective chart review including Body Mass Index (BMI) z-score and 6 parent-reported answers to sleep questions, as well as parent and child Pediatric QL Inventory ™ scores. Data was collected from the electronic medical records for children ages 3-18 years with BMI ≥ 95th percentile for age. The sleep questionnaire allocated habits into 2 categories: Consistency in Bedtime Routine (Consistency) and Arousal-Related Pre-Bedtime Behaviors (Arousal) with higher scores indicating better sleep. Multiple regression analyses examined the effect of sleep habits on the patients' self- and parent-reported QL.
Results: Forty females and 59 males with mean age of 9.82±2.97 had complete data for inclusion. Participants were 58% Hispanic. Consistency in Bedtime Routines predicted higher child-reported psychosocial QL scores [$F(2, 73) = 4.83$, $p < .05$], parent-proxy reported psychosocial QL scores [$F(2, 92) = 4.50$, $p < .05$], child reported physical QL scores [$F(2, 73) = 6.22$, $p < .01$] and parent-proxy reported physical QL [$F(2, 91) = 4.95$, $p < 0.01$]. Arousal-Related Pre-Bedtime Behaviors predicted higher child-reported psychosocial QL scores [$F(2, 73) = 3.41$, $p < .05$], parent-proxy reported psychosocial QL scores [$F(2, 92) = 4.50$, $p < .05$], child reported physical QL scores [$F(2, 73) = 4.79$, $p < .05$] and parent-proxy reported physical QL [$F(2, 91) = 4.87$, $p < .01$].
Conclusions: Better sleep habits are associated with improved QL in obese children in both physical and psychosocial functioning. Future research targeting sleep habits for intervention may impact sleep hygiene, and consequently improve QL of obese children.

Abstract #8: THE BURDEN OF PROOF: THE IMPORTANCE OF CHILD ABUSE PEDIATRICIANS

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Dr. Lauren Conway - University of Oklahoma School of Community Medicine
Mrs. Heather McIntosh - University of Oklahoma School of Community Medicine
Dr. Michael Baxter - University of Oklahoma School of Community Medicine

Background: The efficacy of child abuse pediatricians within multidisciplinary teams (MDTs) regarding child sexual abuse has been studied in previous literature; however, child maltreatment as a whole has received little such attention.
Methods: The study retrospectively reviewed the legal outcomes of 477 confirmed child abuse cases collected from all children evaluated in 2013-2015 at the Children's Advocacy Center (CAC) in Tulsa, OK (N=1705). Medical data from OU-Tulsa's electronic medical record was coupled with records from the Tulsa District Attorney's Office and the Oklahoma State Courts Network (OSCN) website to study court outcomes of all child maltreatment types.
Results: Data analysis yielded 115 unique court cases with 153 defendants, and 151 victims (31.6%). A total of 289 charges were filed resulting in 191 convictions (66.09%). Charges consisted of 50 unique types with most falling under Child Physical Abuse (28.37%), Child Neglect (21.11%), and Child Sexual Abuse (26.64%). Sentencing outcomes varied for defendants; 51 received jail time (mean, excluding life sentences: 4.67 years+12.26), and 92 received probation (mean: 3.33 years+3.87).
Conclusion: Our results show that the majority of suspected child maltreatment cases seen by the child abuse pediatricians at the Tulsa CAC do not result in court outcomes. Those that do are unlikely to result in jail time. Alternative outcomes include probation, or court mandated rehabilitation programs. These findings highlight the importance of child abuse pediatricians in MDTs to discern between true and false medical findings when accusations of abuse arise.

Abstract #9: UNLOCKING IMPLICIT BIAS: IMPLEMENTATION OF AN IMPLICIT BIAS WORKSHOP TO INCREASE RESIDENT PHYSICIAN AWARENESS OF PERSONAL IMPLICIT BIAS AND ITS EFFECT ON PATIENT CARE

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Dr. Jacob Murray - OU-Tulsa
Dr. Jabraan Pasha - OU-Tulsa

Introduction: Unconscious attitudes, also known as implicit biases, are ubiquitous and their effects are wide-ranging. From something as seemingly insignificant as the clutching of a purse in lieu of a passerby to something of potential great consequence such as the lack of a surgical referral, the implicit biases affect many decisions we make. Physicians' decisions are not immune to the influence of unconscious attitudes, and the data showing the effect of implicit bias on healthcare disparities is growing. In the area of cardiovascular disease, it was found that African American patients are less likely to receive coronary artery bypass graft surgery and coronary intervention procedures. African Americans and Hispanics were found to be more likely to receive lower quality care in the management of HIV/AIDS, cancer, and mental health. Given the data linking implicit bias to healthcare disparities, it is important to promote awareness of implicit bias in healthcare providers as individuals. Our study evaluated resident awareness and confidence in managing unconscious attitudes and beliefs that may be affecting patient care.

Methods: Fifty-three internal medicine, pediatric, and family medicine residents at OU-TU School of Community Medicine. Between August 2018 and October 2018, during Academic Grand Rounds, participants attended a 90-minute implicit bias workshop. The interactive workshop aimed to define implicit bias, demonstrate its origins and show its societal impact via lecture, hands-on activities and small group discussion. Via a 7-point Likert scale, we developed a pre and post-workshop questionnaire to measure participants' awareness of implicit bias and confidence in discovering and managing implicit attitudes. Data was analyzed via paired T-test analysis.

Results: Comparing pre and post questionnaires in 53 residents, there was a mean increase of resident physicians' awareness of general, personal implicit bias (mean increase of 0.938, $P<.001$) and awareness of implicit bias toward patients (mean increase 0.698, $P<.001$). The results also reflected an increase in confidence in discovering personal implicit bias (mean increase 0.358, $P<.001$) and in management of implicit attitudes discovered about patients (mean increase 0.321, $P<.001$).

Conclusion: Our implicit bias workshop appears successful in increasing resident awareness of their vulnerability to unconscious attitudes and in increasing their confidence in recognizing and managing these attitudes. Increasing awareness alone has been shown to be effective in limiting unconscious bias. Paired with increased confidence in recognizing and managing these biases, this workshop may be a practical and effective first step towards addressing implicit bias in healthcare providers.

Abstract #13: PEDIATRIC RESIDENT RATE OF BURNOUT: A 3-YEAR TREND

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Dr. Keith Mather - University of Oklahoma School of Community Medicine
Mrs. Tiffani Mabe - University of Oklahoma School of Community Medicine
Ms. Amy Hendrix - University of Oklahoma School of Community Medicine

Background: Burnout lowers residency performance in patient care, systems based practice, problem based learning and improvement, professionalism, and interpersonal and communication skills. Our study seeks to trend the rate of burnout in Categorical Pediatrics Residency Programs and compare the rate of burnout at our institution to nationwide results.
Methods: With the help of the Association of Pediatric Program Directors Longitudinal Education Assessment Research Network (APPD LEARN), the Pediatric Residency Burnout Resilience Study Consortium 2018 Annual Study included 61 training programs in the United States. Our institution has participated in the 2016-2018 studies. The Maslach Burnout Inventory (MBI) was utilized to determine burnout while an additional survey assessed the utilization of a previous site-specific intervention.
Results: Average nationwide burnout among pediatric residents was 54% in 2016 (n=1410), 54% in 2017 (n=1753), and 52% in 2018 (n=1867). The average rate of pediatric resident burnout at our institution was 47% in 2016 (n=17), 63% in 2017 (n=16), and 56% in 2018 (n=18). Burnout in the 2016 Program Year (PGY) 1 was 29% with an increase of 21 percentage points in 2017 PGY2 (total 50%), and a decrease of 7 percentage points in 2018 PGY3 (total 43%). Additionally, 47% of respondents (n=15) across all PGY indicated that they participated in gratitude journaling, a site-specific intervention. Survey response rate for our program in 2018 was 65% compared to the nationwide rate of 62%. Due to small sample size, the study was not able to show statistical significance.
Conclusions: The burnout rate at our institution decreased more than the national average from 2017-2018. The 2016 PGY1 class was monitored as they experienced burnout through three years of residency with the highest rate of burnout occurring in their PGY2. The decrease in burnout during their PGY3 could be due to interventions for the past academic year such as changes in inpatient coverage, protecting weekends off, wellness programs, and gratitude journaling. Our institution will continue previous interventions and implement the following intervention for the next academic year: promoting counseling services, arranging for our Employee Assistance Program to contact all residents to schedule a voluntary appointment, and guarantee from the program to protect appointment time from rotation duties.

Abstract #18: FAILURE TO THRIVE AS A HEALTH INDICATOR OF UNSAFE NEIGHBORHOODS

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Ms. Eden Hemming - University of Oklahoma School of Community Medicine
Ms. Amy Hendrix - University of Oklahoma School of Community Medicine
Mr. Ric Munoz - University of Oklahoma--Tulsa
Mr. Shawn Schaeffer - University of Oklahoma--Tulsa
Ms. April Merrill - Legal Aid of Oklahoma
Dr. Jeanne Hayes - University of Oklahoma School of Community Medicine

Introduction: Failure to thrive (FTT) is a diagnosis given when a child fails to grow and develop appropriately due to an underlying cause of insufficient nutrition. While FTT can serve as an important indicator of serious medical conditions in a child, it can also serve as a portal for insight into the social and environmental conditions surrounding the child hindering them from proper development. This study explored the relationship between poor neighborhood safety, as indicated by poor housing and rate of violent crimes such as homicide and rape, and incidents of failure to thrive (FTT), an indicator of poor growth and development due to undernutrition, in pediatric patients living in Tulsa, OK in 2013-2014.
Methods: Environmental variables used as predictors of FTT were poor housing conditions, as captured by housing code violations, and neighborhood safety, as captured by the incidents of homicide and rape per census tract. Housing and crime data were collected from the Tulsa Health Department and Tulsa Police Department respectively for the Tulsa metro area. FTT diagnoses were collected from the University of Oklahoma Health Sciences Center electronic medical records serving the same area. 225 census tracts and 2 calendar years of data were included in analysis. 2013 was used as the calibration sample for the prediction model while 2014 was used as a validation sample. Hierarchical regression was used to analyze the data.
Results: Results from the calibration sample in step 1 of the hierarchical regression model indicated that housing complaints were a significant predictor of FTT cases in a particular census tract (R_{adj}^2 = .063; p <.01). In step 2, after controlling for poor housing conditions, the results indicated that incidents of homicide and rape were also distinct and significant predictors of FTT cases in a particular census tract (ΔR^2 =.065; p <.001). Results from the validation sample supported the overall stability of the model, with housing complaints once again serving as a significant predictor of FTT cases (R_{adj}^2 = .043; p < .01), while incidents of homicide and rape continued to serve as unique predictors of FTT cases in a census tract after controlling for housing conditions (ΔR^2 = .046; p < .001).
Conclusion: Our research suggests the importance of interventions at the community level that improve both housing quality and neighborhood safety in order to significantly reduce incidents of FTT diagnoses in the pediatric population for a given community.

Abstract #49: HOPE-BASED SMALL GROUP INTERVENTION IN A HOMELESS ADULT POPULATION: PILOT INVESTIGATION

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Prof. Chan Hellman - University of Oklahoma--Tulsa

Background: Homelessness and other forms of housing insecurity are major threats to public health. Strategies to leverage positive psychological factors, such as hope, have been shown to improve health status and other well-being indicators in vulnerable populations. Charles Snyder's operationalized theory of hope has been effectively applied to intervention designs to increase long-term hopeful cognition. The purpose of this pilot study is to determine if an open-model, small group intervention can increase levels of hope among homeless adults and if there are relationships among hope, goal attainment, total social support, and satisfaction with life in this population.
Methods: This intervention study consisted of a novel small group curriculum based on Snyder's hope theory and previous hope-based interventions in community samples. Ninety-three participants voluntarily participated in one-hour small group sessions focused on one of three topics related to hope theory: goals, pathways, or agency. The sessions were held on a weekly basis at three Mental Health Association Oklahoma facilities in Tulsa, Oklahoma. The group sessions were open, allowing new participants to join at any time. Pre- and post-session surveys were administered that contained the Adult Dispositional Hope Scale, Goal Attainment Scale, Multidimensional Scale of Perceived Social Support, and Satisfaction with Life Scale.
Results: Paired t-tests demonstrated no significant differences between pre- and post-session hope scores, including the pathways and agency thinking subscores. Univariate ANOVA testing showed no significant differences in hope scores based on the number of sessions. Pearson correlation analysis revealed significant positive correlations between hope and goal attainment ($r(120) = .516$, $p < .0001$), hope and satisfaction with life ($r(166) = .625$, $p < .0001$), and hope and total social support ($r(93) = .535$, $p < .0001$). Regression modeling showed that total social support and satisfaction with life accounted for approximately 40% of the variance in hope [$F(2, 76) = 25.14$; $p < .0001$].
Conclusion: The lack of a significant intervention effect on hope suggests that homeless adults might require a more specific and perhaps more intensive approach to increase dispositional hope. The regression results support the importance of social support in increasing hope, which suggests that organizations like the Mental Health Association Oklahoma are important for achieving this outcome. Given that homelessness increases exposure to extreme physical and psychosocial stressors that can severely affect hope, future interventions in this population could explore how comprehensive support services that mitigate the effect of these stressors impact hope.

Abstract #56: CLIMATIC INFLUENCE ON SUICIDE AMONG LESBIAN, GAY, BISEXUAL, AND QUESTIONING 9-12TH GRADERS

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Dr. Jedediah Bragg - University of Oklahoma--Tulsa
Dr. Julie Miller Cribbs - University of Oklahoma--Tulsa
Prof. Chan Hellman - University of Oklahoma--Tulsa
Ms. Jessica Stanley - University of Oklahoma--Tulsa
Ms. Alanna McCaskey - University of Oklahoma--Tulsa

Background: Among the most disturbing and pressing social issues are the suicidality rates among adolescents with minority sexual orientations, which are appallingly and disproportionately high—with some groups being up to four times as likely to have made a suicide attempt. Consequently, recognizing the factors contributing to these rates must involve the combined efforts from mental health professionals, policy makers, and social justice advocates. Social workers, in particular, hold a unique position with which to address the issue's various intricacies.
Methods & Results: A binary logistic regression model evaluated combined data from the Human Rights Campaign's 2016 State Equality Index and the Centers for Disease Control and Prevention's 2017 Youth Risk Behavior Surveillance, exploring the relationship between social conditions and attempted suicide among 9^{th} to 12^{th} grade students identifying as lesbian, gay, bisexual, or questioning sexual orientations (LGB-Q). The final sample covered 24 states and included 13,749 students. Results were statistically significant , predicting 27.3% of the variance in suicide attempts. Results support hopelessness, bullying, threats, fighting, school nonattendance (due to safety concerns), early age of sexual activity, higher numbers of sexual partners, and the State Equality Index as all related to a greater likelihood for suicide attempts among LGB-Q students. The study was determined as not needing approval by the university's Institutional Review Board due to the sole use of secondary, de-identified data.
Conclusion: LGB-Q adolescents experience a disproportionately higher rate of risk factors and behaviors compared to their straight/heterosexual peers. This study illustrates that along with these risk factors and behaviors, the probability of attempting suicide increases significantly. Community and school climates—the contexts in which LGB-Q adolescents thrive or suffer—influence the capacity to form healthy self-identities, develop competence, feel safe, and locate support. With their perspectives of micro-macro interactions, social workers are not only in a prime position to advocate and intervene at the societal level for adolescents with minority sexual orientations, but also ethically and professionally obligated to challenge such injustice. When events foment controversy around LGB-Q adolescents, social workers and others who work with youth should take care to send messages of inclusion, safety, affirmation, and hope for a better tomorrow while simultaneously working to bring about societal, political, and cultural change.

Abstract #63: FACTORS PREDICTING SEXUAL ASSAULT REPORTING BEHAVIOR

Ms. Annemarie Pickering - University of Tulsa

Rape in America continues to be the most underreported violent crime. The decision to not report sexual violence is a public safety concern, warranting inquiry into factors involved in the decision to report. Surveys of agencies working with sexual assault survivors stated that public education about sexual assault and improved training for police would increase rates of reporting to the police. The current study examined potential factors that may impact whether a victim will report after getting a medical examination. The current study utilized data obtained from survivors of sexual assault's medical exams conducted at a Midwestern hospital (N=1,151; of which 204 did not report). Chi-square analyses showed that male survivors (p<.05) and survivors who showered after the assault (p<.01) are less likely to report. Results of logistic regression analyses indicated that the survivor's race (p<.01) and the longer the amount of time between the reported assault and the medical exam (p<.05) significantly predicted whether or not a person will report. This study hopes to help inform public education about reporting rape and increase support for survivors. These results demonstrate that there are potentially false beliefs held by survivors and important demographic characteristics of survivors that impact a survivor's decision to report.

Abstract #91: FACTORS THAT DECREASE POSTTRAUMATIC GROWTH IN SEXUAL ASSAULT SURVIVORS

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Ms. Jenny Lee - University of Tulsa
Mr. Jim Scholl - University of Tulsa
Mr. Chris Cranston - University of Tulsa
Dr. Joanne Davis - University of Tulsa

Background: Some survivors report growth and positive changes after traumatic assaults, typically resulting in decreased distress. A study of factors that negatively impact posttraumatic growth (PTG) could help build treatments that increase PTG in survivors, thus increasing resiliency. The most common factors are maladaptive coping mechanisms (denial, substance abuse, and behavioral disengagement), and self-blame for assaults. Although maladaptive coping and self-blame correlate positively with one another and negatively with PTG, self-blame is an inconsistent predictor. This study hypothesized that maladaptive coping mechanisms would explain the effect of self-blame on PTG by acting as a mediator.
Methods: Sexual assault survivors were assessed in a broad survey for their experienced degree of PTG, their attribution of the assault, and their coping mechanisms.
Results: Self-blame attribution of assault was not significantly correlated with experience of PTG (r=.24, *n.s.*). Maladaptive coping mechanisms were not significantly correlated with experience of PTG (r=.04, *n.s.*). Self-blame attribution of assault and maladaptive coping mechanisms were not significantly correlated (r=.15, *n.s.*).
Conclusion: Because no correlations were found between maladaptive coping mechanisms, self-blame, and PTG, a mediation analysis could not be conducted. Findings therefore did not support the proposed hypothesis that maladaptive coping mechanisms would mediate the relationship between self-blame and PTG. This finding could indicate that survivors are a more unique trauma population than previously believed.

Abstract #92: PREVALENCE AND EFFECTS OF UNDERREPORTING ON THE MMPI-2 AMONG PARENTS INVOLVED WITH DHS

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Ms. Allyson Sharp - University of Tulsa
Mr. Jordan Hoffmeister - The University of Tulsa
Mr. Michael Basso - The University of Tulsa

Background: The Minnesota Multiphasic Personality Inventory-2 (MMPI-2) is a psychological measure of personality, emotional distress, and other symptoms of mental illness. It is frequently used to evaluate individuals in clinical and forensic contexts. Among parents whose custodial rights have been suspended because of abuse or neglect, states often obligate parents to complete the MMPI-2 before reuniting them with children. Some research has shown that parents typically under-report psychological problems on the MMPI-2 (cf. Carr et al., 2005). However, little research has reported on the observed probability of under-reporting in this forensic context. Additionally, research is needed to determine to what extent under-reporting may influence reports of psychopathology on the MMPI-2.
Methods: Participants were 101 individuals who had parental rights suspended by the State of Oklahoma consequent to abuse or neglect. All of the participants completed the MMPI-2. Scales L, K, and S were evaluated to measure under-reporting. The L scale was used to measure positive self-presentation. The K scale was used to measure defensive responding. The S scale was used to measure superlative self-presentation. Clinical scales from MMPI-2 measuring depression, somatic concerns, stress-proneness, antisocial behavior, paranoia, anxiety, thought dysfunction, and hypomania were used to evaluate if under-reporting affected reports of psychopathology.
Results: The prevalence of under-reporting was 23.8% for L, 18.8% for K, and 10.9% for S. The L scale had significant negative correlations with all clinical scales except depression. These correlations ranged from -.23 to -.58. The K scale had significant negative correlations with all clinical scales, which ranged from -.31 and.-70. The S scale had significant negative correlations with all clinical scales, which ranged from -.34 and -.71.
Conclusion: Under-reporting for parents undergoing psychological evaluations consequent parental right suspension was found to be prevalent for both positive self-presentation and defensiveness. Furthermore, under-reporting was related to lower reports of psychopathology on most of the MMPI-2 clinical scales. This indicates that effective assessment of under-reporting in this forensic context is essential for psychodiagnostics.

Abstract #94: CONCORDANCE BETWEEN MMPI-2 AND MMPI-2-RF UNDERREPORTING SCALES

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Ms. Manal Abu Sheikh - University of Tulsa
Mr. Jordan Hoffmeister - The University of Tulsa
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Background: The Minnesota Multiphasic Personality Inventory-2 (MMPI-2) and its abbreviated successor the MMPI-2 Restructured Form (MMPI-2-RF) are frequently used to evaluate individuals in a variety of clinical and forensic contexts. Among parents whose custodial rights have been suspended because of abuse or neglect, states often obligate parents to complete the MMPI-2 or MMPI-2-RF before reuniting them with children. Some research has shown that parents typically under-report psychological problems on the MMPI-2. In doing so, their need for treatment may be obscured and decisions whether to maintain foster care of children may be hindered. Although research has been conducted with this population using the MMPI-2, no research to date has examined the ability of the MMPI-2-RF to detect dishonest reporting by parents in custody decisions. In particular, because of changes in validity scale composition, concordance between the MMPI-2 and MMPI-2-RF in detecting underreporting is uncertain.
Methods: Participants included 101 individuals who had parental rights suspended by the State of Oklahoma consequent to abuse or neglect. All participants underwent a psychological evaluation to determine child placement decisions and treatment plans and were administered the Mini International Neuropsychiatric Interview. All of the participants completed the MMPI-2. The MMPI-2 underreporting scales L, K, and S were scored and evaluated. The MMPI-2-RF is an abbreviated version of the MMPI-2, and a subset of the MMPI-2 items comprise the corresponding validity scales on the MMPI-2-RF.
Results: Regarding the Lie, Defensiveness, and Superlative Self-Presentation scales (L, K, and S respectively), the correlational comparisons between the MMPI-2 and the MMPI-2-RF were as follows: the correlation between the L scales was 0.94 ($p < 0.001$); the correlation between the K scales was 0.91 ($p < 0.001$); the MMPI-2 S scale and the MMPI-2 K scale had a correlation of 0.89 ($p < 0.001$); and the MMPI-2-RF S scale and the MMPI-2-RF K scale had a correlation of 0.84 ($p < 0.001$).
Conclusions: Given the high correlations between the underreporting validity scales on the MMPI-2 and the MMPI-2-RF, there is evidence that the MMPI-2 and the MMPI-2-RF could be used interchangeably in DHS cases to aid in determining child placement decisions and parental treatment plans. Since the scales on the MMPI-2-RF detect underreporting just as well as the scales on the MMPI-2, and due to the brevity of the MMPI-2-RF, it may be a preferable instrument to assess underreporting in this population.

Abstract #95: AN EXPLORATION OF ACADEMIC STRESS MODERATING BINGE DRINKING AND SEXUAL ASSAULT

Ms. Gillian Jenkins - University of Tulsa

The focus of this study was to examine academic stress as a possible moderator between binge drinking and sexual assault. Further, we looked at the influences of school year and membership in a Greek organization could have on this potential relationship. Finally, this study examined if the relationship was bi-directional, with academic stress still conceptualized as a moderator. Participants came from a Midwestern university, and were aged 18 years or older. Participants took a campus climate survey, and the study looked at items concerning demographics, behavior with drugs and alcohol, experiences with unwanted sexual contact, and sexual assault. There were 550 participants who took this survey, which accounts for 12.5% of the population on campus. The distributions of binge drinking and academic stress were found to be skewed and kurtotic, so participants were randomly matched based on sexual assault experience to help alleviate skewness and kurtosis. After matching the participants based on their experiences with sexual assault, ensuring that there was an equal number of participants who have experienced sexual assault and who had not, there were a total of 100 participants. Contrary to the hypothesis, academic stress was not found to be a statistically significant moderating variable between binge drinking and sexual assault. Furthermore, Greek affiliation did not significantly contribute to the regression model. One possible explanation for the findings is that membership in Greek organizations can be a protective factor under certain situations. Moreover, there may be a different relationship between academic stress, binge drinking, and sexual assault.

Abstract #96: ANALYSIS OF DEPRESSION, ANXIETY, AND DRUG USE IN SEXUAL MINORITIES AND HETEROSEXUALS

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Ms. Elisabeth Akeman - Laureate Institute for Brain Research
Mr. James Touthang - Laureate Institute for Brain Research
Dr. Robin Aupperle - Laureate Institute for Brain Research

Background: Previous research indicates that sexual minorities are more likely to be diagnosed with mental illnesses and experience greater levels of depression and anxiety. This study examined whether these relationships held true in a large transdiagnostic mental-health sample screened at Laureate Institute for Brain Research.
Methods: A total of 822 participants completed a screening assessment that included demographic and sexuality questions and the Patient Health Questionnaire (PHQ-9), Overall Anxiety Severity and Impairment Index (OASIS), and Drug Abuse Screening Test (DAST). Individuals identifying as homesexual or bisexual were compared to a matched (by age and education) comparison heterosexual sample on depression, anxiety, and substance use scores using independent samples t-tests.
Results: There were 83 sexual minorities and a matched sample of 83 heterosexuals. There were no significant differences in anxiety [$t(82)= 0.51, p=0.61$] and substance use scores [$t(82)=0.45, p=0.65$] between groups, but there was a trend difference in depression scores [$t(82)=1.87, p=0.06$]. If sexual minorities were compared to the full sample of heterosexuals (N=739) without matching, the differences in depression were more robust ($p< .01$).
Conclusion: In our current sample, sexual orientation did not incur as much risk for greater mental health problems as expected based on previous literature. Findings suggest that matching groups on demographic variables may reduce observed symptomatic differences related to sexual orientation. Future analyses will investigate potential protective or risk factors for sexual minorities; including social support, previous treatments, and trauma history.

Abstract #102: NUTURING HOPE AND CHARACTER STRENGTHS IN CHILDREN EXPOSED TO DOMESTIC VIOLENCE

Mr. Jason Featherngill - OU-Tulsa

Background: Studies show children exposed to violence are at an increased risk for anxiety and depression, social isolation, increased physical and psychological aggression, and propensity to perpetuate the cycle of domestic violence. Thepurpose of this study is to present findings of a camp-based intervention to increase hope in children exposed to domestic violence.
Methods: One thousand and eighty-five children from 14 states in the US provided responses to a self-report survey measuring hope and character strengths across three time periods.Camp counselors provided observational assessments on 963 campers on the first and last day of camp. Matched observational comparisons were made for camper Hope and Character Development in the areas of Zest, Grit, Optimism, Self-Control, Gratitude, Curiosity, and Social Intelligence. Individual Family Justice Centers were responsible for recruiting, selecting, consenting children and guardians, and data collection. Completed surveys were then provided by the individual Family Justice Centers to Alliance for HOPE International to ensure data were de-identified, organized by state, and sent to the University of Oklahoma research team.
Results: A repeated measures ANOVA showed increases in hope [$F(2, 732)=34.97$; $p< .05$] and resilience [$F(2, 710)=13.98$; $p< .05$] were statistically significant. Correlational analysis demonstrated that an increase in children's hope was associated with increases in character strengths as rated by camp counselors. More specifically, higher scores in Hope were associated with higher levels of energy (Zest, r=.21*), perseverance toward goals (Grit, r=.17*), ability to regulate thoughts, feelings and behaviors (Self-Control, r=.17*), an expectation that the future holds positive possibilities (Optimism, r=.20*), appreciation toward others (Gratitude, r=.18*), desire to seek out new things (Curiosity, r=.17*), and awareness of the feelings and motivations of others (Social Intelligence, r=.16*) * = $p <.05$. These results are discussed as they relate to research informed interventions focused on increasing hope among children exposed to domestic violence.
Conclusion: The results of this study provide compelling evidence that Camp HOPE improves the hope of children in a manner that was self-reported by the children and teens and observed by the camp counselors. Moreover, increases in Hope were associated with the character strengths of Zest, Grit, Self-Control, Optimism, Gratitude, and Social Intelligence, and Curiosity which have been shown to help prevent or buffer against negative effects of stress and trauma. Psychological strengths like hope tend to serve people best in difficult times. The capacity to formulate pathways and dedicate mental energy (agency) is the foundation to successful goal attainment.

Abstract #107: POLITICS AND POVERTY: DOES SIMULATION EFFECT INDIVIDUALS' PERCEPTION OF THE PROBLEM?

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Mr. Ric Munoz - University of Oklahoma--Tulsa
Mx. Eden Nay - University of Oklahoma--Tulsa
Ms. Alanna McCaskey - University of Oklahoma--Tulsa

Background: As of 2017, the state of Oklahoma reported 15.8 percent of residents lived at or below the federal poverty line. Numerous trajectories have been associated with impoverished communities such as an increase in adverse childhood experiences. How people view impoverished individuals and communities can further perpetuate bias and prejudice and further marginalize those needing additional support. The purpose of this project is to explore differences in attitudes towards poverty categorized by political ideology and explore the effect of poverty exposure in shifting perceptions of the social problem.

Methods: The pretest-posttest study design measured "Attitude Towards Poverty" (ATP) during University of Oklahoma-Tulsa's poverty simulation intervention. The ATP measure consists of three subscales: (*a*) personal deficiency; (*b*) stigmatization, and (*c*) structural. Those scoring high in personal deficiency view poverty as a personal deficit and fault the impoverished for their circumstances. Stigmatization scores participants' belief of stigmatization within poverty. High scores in the structural subscale indicate the participant perceives poverty to be a systemic issue. Participants completed a four-hour mock experience that replicated various systemic barriers those living in poverty face in their day-to-day activities. Individuals encountered obstacles to completion by drawing various cards that could interfere with their ability to complete the assigned task.

Over three years, an estimated 2,000 individuals have completed the poverty simulation. Participants were referred to the exercise by employers for workplace training, teachers, and helping professionals. Matching of the pre and post-test results produced a total sample of 459. Identification of political ideology produced 41% liberal, 28.8% moderate, and 30.3% conservative.

Results: Data analysis was conducted using the repeated measures analysis of variance (ANOVA). Results indicated a significant increase in favorable ATP across all political groups after intervention. Significant difference was found in total ATP score between liberal and moderate and liberal and conservative groupings. Upon examination of the three subscales, significant difference was found between liberal and moderate and liberal and conservative ideology among all three factors. No significant difference in total ATP score and subscale scores was found between moderate and conservative ideology.

Conclusion: Implications of the study could contribute to greater discussion among policy makers and community members about the role of political identification in how societal problems are perceived. The success of the intervention highlights the need for exposure to social problems prior to legislative action and further examination of Oklahoma's political groupings and how they construct social problems.

Abstract #108: SEX DISPARITIES IN ADVERSE CHILDHOOD EXPERIENCES

Mrs. Heather Hanks - University of Oklahoma--Tulsa

Introduction: The experience of childhood adversity has been linked to numerous health, social, and behavioral problems throughout adulthood. Theory predicts that female individuals are more likely to experience early adversity when societal norms condone gender inequality, violence, and favor male dominance. Thus, based on sexist and misogynistic norms of US society, I hypothesized that individuals who self-identify as female would experience childhood trauma, as measured by the adverse childhood experiences scale, at higher rates than their male counterparts. If sex disparities indeed exist within childhood trauma survivors, this would highlight the need to develop interventions that mitigate the effects of trauma across the life-span for female survivors.

Methods: The study's sample consisted of 345 adults between the ages of 18-64, living in the United States. They completed an online survey containing the Revised Adverse Childhood Experience Questionnaire (R-ACE). The R-ACE scale expands on the original 10-item ACE scale to 14-items that measure adult perpetrated maltreatment, household dysfunction, peer victimization, exposure to community violence, and economic hardship. Responses on the R-ACE are captured in a dichotomous yes or no format with total scores ranging from 0 to 14. The online survey also includes various demographic items, include a 3-item question that asks for sex identification of either 1.) female; 2.) male; and 3.) other. This study was determined to be a secondary data analysis by the Institutional Review Board from the institution with which the researcher is affiliated.

Results: An analysis of variance (ANOVA) was performed comparing the average ACEs scores between two groups: 1.) a group who reported as female (*N* = 281) to 2.) a group whom reported as male (*N* = 64). Participants who identified as "other" were excluded because only 2 respondents identified with that group, leaving too few for analysis.

The results of the ANOVA indicated that the group reporting as female had a significantly higher ($p<.01$) average ACE score (3.69) compared to the group who reported as male (2.20). The effect size (Cohen's d) of the difference between the two groups was moderate according to the heuristics of the social sciences.

Conclusion: The results indicate that individuals reporting as female had an average R-ACE score that was almost double what individuals reporting as male experienced. Such results support the need to have specialized services for females with a history of childhood adversity in order to combat the negative effects trauma can have on overall well-being.

Abstract #117: ANALYZING PERCEIVED RISK OF TOBACCO PRODUCTS AMONG FOOD PANTRY CLIENTS IN OKLAHOMA

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Background: Populations experiencing food insecurity may have a higher smoking prevalence, and those who smoke cigarettes minimize the personal health risks of smoking. Although these disparities have been identified, the perceived risk of tobacco products has not been explored in a food insecure population. In this study, we analyzed the perceived risk of tobacco products among Oklahoma food pantry clients, a population with high rates of food insecurity.
Methods: In partnership with Oklahoma's two food banks, we randomly selected and surveyed food pantry clients (n=376) between April and October 2016. We assessed use and perceived risk of multiple tobacco products. Respondents were asked to rate the health risk for each tobacco product on a 4-point Likert scale, ranging from "no risk" to "great risk," with a fifth response of "can't say." Responses were dichotomized to "great risk" and "not great risk". Since research to date indicates no tobacco products are safe, our interest was in the proportion of responses ascribing "great risk" to each tobacco product. Chi-squared tests were used to compare risk perceptions among tobacco users and non-users. All statistical analyses were performed in SAS, version 9.4.
Results: More than half of respondents reported current tobacco use (53.8%). Approximately two-thirds perceived cigarettes (65.9%), cigars (64.9%), and smokeless tobacco (65.2%) as great health risk, while fewer perceived other tobacco products as a great health risk with the lowest proportion perceiving great risk for disposable e-cigarettes (51.9%) and vapes (46.6%). There were disparities in risk perceptions among tobacco users and non-users with differences ranging from 16.5% for smokeless tobacco to 29.8%for vapes. Additionally, there were differences in risk perceptions by tobacco product among those using that specific tobacco product.
Conclusion: Similar to our findings, a recent review reported most studies found cigarettes were perceived as greater risk than other non-combustible tobacco products. Media messages funded by the Oklahoma Tobacco Settlement Endowment Trust (TSET) on adverse health effects of cigarettes and smokeless tobacco may be contributing to more Oklahomans perceiving these products as great risk. Similar to findings from the review article, our study found fewer pantry clients perceived using e-cigarettes as a great health risk. Targeted health promotion and communication is needed to address misperceptions of risk, and additional research is needed to identify how to do so effectively.

Abstract #120: SURVIVOR AND PERPETRATOR AFFILIATION AS A PREDICTOR OF REPORTING AND INSTITUTIONAL BETRAYAL

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Ms. Jenny Lee - University of Tulsa
Ms. Kelsey Hancock - University of Tulsa
Mr. Jim Scholl - University of Tulsa
Dr. Joanne Davis - University of Tulsa

The role of student affiliation is of debatable influence on likelihood to report a sexual assault. Survivors who know their perpetrator or have affiliation may be less likely to report (Felson & Paré, 2005). Likewise, students may fear retaliation or feel unsupported by the organization they are affiliated with due to their perpetrator's affiliation with the same organization (e.g., Sable et al., 2006). However, social support from affiliated groups as a key factor in increasing likelihood to report is something literature often neglects to examine. There is evidence that social support can lead to decreasing feelings of institutional betrayal, which is often found to decrease reporting and exacerbate negative trauma-associated symptoms (Parnitzke,Smith, & Freyd, 2013). The present study seeks to examine affiliations of both survivors and their perpetrators as a predictor of likelihood to report, as well as how these affiliations affect survivors' endorsement of institutional betrayal. Data was collected as part of a larger survey examining the experiences, perceptions, and attitudes with/towards sexual violence at a small Midwestern university. It is hypothesized that when a survivor and perpetrator are affiliated with the same or similar organizations, a survivor will be less likely to report and will report greater feelings of institutional betrayal. Examining the correlations of reporting sexual assault may help universities to better understand how on-campus organizations can provide support for and protect survivors in order to increase reporting of assaults and decrease feelings of institutional betrayal.

Abstract #121: VALIDATING IMAGE CUES TO ELICIT CRAVING IN SUBJECTS WITH METHAMPHETAMINE USE DISORDER

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Background: In Oklahoma, the number of lethal Methamphetamine overdoses has doubled in recent years. Despite this, there are no approved pharmacological treatments for Methamphetamine Use Disorder (MUD). Craving, a feature of addiction noted by the inclusion as diagnostic criterion for Substance Use Disorder in DSM 5, is thought to predict relapse. In order to understand the relationship between craving and relapse, studies have examined the role of visual cues in inducing craving in cocaine, opiate, alcohol, and tobacco users. This study's purpose is to identify and validate a series of image cues that can induce drug craving among methamphetamine users in controlled experimental conditions paired with neutral control cues.
Methods: We selected 200 cue-induced craving images and 100 neutral images (for control purposes) that maintained psychosocial features, hue, saturation, and brightness from Shutterstock. We worked with volunteerswith a history of MUD that are in recovery for 5+ years in 60-90 minute sessions to narrow down these images. Following this selection process, 108 cue-induced craving images (and 72 corresponding neutral images) were placed into 6 categories based on visual features. 22 subjects with a previous history of MUD and at least 6 months of abstinence were enrolled. Participants were invited for a session to view a randomized series of the images on a computer screen. Subjects were asked questions to gauge the effectiveness of the images in inducing craving (on a scale of 1-100) and arousal/valence, as well as to identify the overall relatedness to MUD.
Results: Images in the Drug Injection category (n=12) had the greatest craving response of 90.0 ± 9.5. In comparison, their control group (n=12) had the least craving response of 7.3 ± 6.5. A negative relationship was noted between average craving and number of times the subject used methamphetamine (R = -0.49). No relationship was found between average craving and amount of money spent on methamphetamine in the last thirty days before treatment (R=-0.11). There was no significant difference in the subject's desire to use drugs (p=0.189), feelings of negativity (p=0.625) or feelings of control (p=0.733) before and after the cue exposure.
Conclusion: Most of the selected images are effective in inducing craving. This study provided a database of photos including detailed psychophysics and psychological features. We hope that by presenting a validated, standardized, and efficacious set of images, we can assist the field with experimental paradigms targeting successful treatments to the patients suffering from MUD.

Abstract #126: IS THE GRASS ALWAYS GREENER? AN ANALYSIS OF RESIDENT AND PHYSICIAN CAREER CHOICE

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Dr. Peter Nelson - University of Oklahoma--Tulsa
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Purpose: Many studies have documented the exceptionally high rates of burnout and career dissatisfaction in healthcare professions; however, less research has been conducted to describe reasons for these findings in healthcare professionals' own words. The purpose of this study was to identify reasons why physicians may or may not choose this profession again. The findings provided here are part of a larger study which assessed PTSD and burnout among medical trainees and practicing physicians.
Methods: Surveys were completed by residents and practicing physicians (n=4310). Participants were asked, "If you could revisit your career choice, would you choose to become a physician again?" followed by an exploratory qualitative statement, "Please describe why you would consider a different career." Using MAXQDA Software, three researchers individually coded responses based on similar ideas, interpretation of the author, and prior experience. Codes were merged into a single document for analysis, discussion, and reconciliation. Common themes representing the most salient responses were developed.
Results: Among the residents, 1287 chose "yes or probably yes" (66.8%), 195 chose "neutral" (10.1%), 292 chose "no or probably not" (15.2%) in response to the question, "If you could revisit your career choice, would you choose to become a physician again?" The responses for practicing physicians were 1758 (73.8%) chose "yes or probably yes", 188 "neutral" (7.9%), 291 (12.2%) chose "no or probably not." Among the themes, some were inherent to the job itself, such as, "responsibility." Other themes related to the overall field of medicine, such as, "$ driven/systemic issues" and "medicine is litigious." Another theme group related to aspects of personal life, such as, "time with family" and "personal health."
Conclusions: It may be for many residents simply seeing the light at the end of their training could be the difference between enjoying their career or regretting it. The list of reasons why physicians may or may not choose this field again is as extensive and varied as the collection of men and women who make up the profession. The findings suggest there are common themes influencing whether physicians would choose to become physicians again that are important to acknowledge if we want to improve physician wellness. As a profession, there needs to be greater recognition of the unalterable weightiness inherent to caring for sick patients beginning early on in training long before student becomes attending.

Abstract #128: RELATIONSHIP BETWEEN ADOLESCENT'S WEEKEND SCREEN TIME AND INTELLIGENCE

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Background: Approximately 99% of US adolescents use the internet, 85% engage in electronic gaming (Rikkers et al., 2016), and 97% have at least one electronic item in their bedroom. Screen time has been implicated in negative outcomes such as obesity (Wen, 2014), sleep disturbance (Cespedes, 2014) and may also be related to intelligence (Walsh, 2018).
Methods: Data from the National Institute of Mental Health Data Archives – Adolescent Brain Cognitive Development (ABCD) Study (https://dx.doi.org/10.15154/1412097) was used to compare screen use and intelligence in 9-10 year olds (n=3950). Variables were: self-reported summed screen hours for an average weekend day (tv/video viewing, video games, social media/texting, etc) and age-corrected fluid and crystallized intelligence scores from the NIH Toolbox Cognitive Function Battery.
Results: Generalized Additive Mixed Models (GAMM4, R) was run through the Data Exploration and Analysis Portal. The analysis controlled for fixed effect covariates: race/ethnicity, sex, education, parental income, marital status and random effects for family and ABCD site. A small, but significant ($p<0.01$) negative correlation was found between the amount of screen time and fluid ($R2=0.08$, $R2=0.35\%$) and crystallized ($R2=0.08$, $R2=0.5\%$) intelligence. Several of the controlled parameters had a significant positive effect on the results including: child age, race/ethnicity, sex, and parent education, marital status and income.
Conclusion: Our results show a negative correlation between the amount of time kids spend using screens and their cognition scores. Intelligence is influenced by multiple factors including family income, education and other environmental influences (Tucker-Drob, 2013). In addition, this study shows that screen time may also be related to cognition and it will be interesting to follow this relationship over time in this population.

Abstract #130: HOPE-BASED INTERVENTIONS IN COMMUNITY SETTINGS: A SYSTEMATIC REVIEW

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Ms. Sophia Sakers - OU
Mr. Ashten Duncan - OU-Tulsa
Ms. Gabrielle Carmichael - OU
Prof. Chan Hellman - University of Oklahoma--Tulsa

Background: Positive psychology as a field has grown rapidly in recent years. Charles "Rick" Snyder's hope theory, a positive psychological framework centered on goal setting and attainment, describes how agency thinking and pathways thinking influence goal-directed energy. Seminal research has revealed how hope is amenable to interventions aimed at promoting hopeful cognition. While the current evidence available on hope supports its importance in influencing quality of life indicators, it is unclear how hope-based interventions can be implemented in community settings. This study aimed to address this knowledge gap by examining the content and outcomes of different published studies.
Methods: A systematic review of articles published between December 1995 and July 2018 was conducted. Academic Search Premier, Web of Science, PubMed, PsychINFO, SocINDEX, JSTOR, Ovid MEDLINE, and PsycTESTS were queried to retrieve articles using keywords such as hope theory, Snyder, intervention, goal setting, mental health, homelessness, depression, anxiety, PTSD, and cancer. Full-text articles were included in the analysis only if they described interventions designed to modify dispositional or state hope (e.g., hope therapy, collaboration goal technology, etc.) and were available in English. Articles were excluded if they had a non-intervention study design or if they were not directly related to Snyder's hope theory (e.g., faith-based hope, Herth Hope Index, etc.). Vote counting was performed to decide on which studies to include. Articles were analyzed on the basis of intervention methodology, study duration, and target population to evaluate the heterogeneity of the evidence.
Results: Twenty-six studies employing a hope-based intervention design were analyzed. The intervention designs were heterogeneous, with the most common methodology being hope group therapy in three studies. The study durations varied, with thirteen long-term (i.e., >3 weeks) interventions being more likely to produce significant increases in hope than short-term (i.e., <3 weeks) ones. The studies were conducted in various settings with several different target populations, including inpatient, college student, homeless, and incarcerated populations.
Conclusion: Hope-based interventions are effective across a range of settings and populations. The findings reported in the different studies show that a community approach to hope building could involve holding focused weekly meetings for at least three weeks and incorporating community-specific goal-setting exercises. In addition to increasing hope, interventions of this design may also increase long-term academic, career, and personal success. More research is needed to determine the long-term effects of hope-based interventions and focus on a subset of intervention methodologies to strengthen the evidence base.

Clinical Quality Improvement

Abstract #5: IMPLEMENTATION OF FLUORIDE VARNISH APPLICATION IN A LARGE PEDIATRIC CLINIC

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Dr. Jeanne Hayes - OU-Tulsa
Dr. A. Shea Bowling - OU-Tulsa

Background: Early childhood caries are the number one chronic disease affecting young children, and it disproportionately affects children of low-income families. Caries have many potential consequences, such as pain, impaired chewing, infection, increased caries in permanent dentition, school/work absences, difficulty sleeping, poor self-esteem, and extensive dental work. Studies have demonstrated that applying fluoride varnish decreases caries by 30-35%. In 2014, the USPSTF recommended that primary care providers apply fluoride varnish to the teeth of infants and children every 6 months from primary tooth eruption through age 5.
Aim: We aim to establish a fluoride varnish program in a large clinic setting and obtain a 50% fluoride varnish application rate for well child checks (WCC) from 12 months to 4 years over a 2-year period (8/1/2018 to 7/31/2019).
Process for Improvement: Initial preparations included completing an online oral health curriculum, discussing processes with local pediatric dentists, obtaining varnish supplies, and adding tracking and billing functionality to the EMR. For cycle one, piloting residents applied varnish within their personal patient panels at designated WCC. This cycle revealed the feasibility of the project. The second cycle, extended applications to faculty panels. We assessed the percentage of applications by calculating the proportion of fluoride varnish application codes (CPT 99188) included in encounters with early childhood well visit codes (CPT 99392). The third cycle, residents viewed a fluoride varnish application demonstration by a pediatric dentist, application was opened by to all providers in the clinic and application rate was assessed as in cycle 2. The fourth cycle, WCC recommendations were reviewed by clinic administration and summary sheets were revised to include fluoride varnish applications. Summary sheets were distributed amongst providers and staff.
Conclusion: Implementation of fluoride varnish application is feasible in a large academic pediatric clinic, though efficiency and integration into providers workflow can be difficult. The application rates were 1.5% following cycle 2, 7.0% following cycle 3, and 23.2% following cycle 4. While both attendings and residents completed the Smiles for Life curriculum, this intervention did not seem to impact fluoride varnish application rates. Residents appeared to be motivated following fluoride varnish demonstration by pediatric dentistry. Attending physician varnish applications increased following clinic administration recommendations and revised summary sheets. Obstacles seen with regard to applying fluoride varnish include time required to apply the varnish, preventative health service fatigue, the necessity of attendings being present for resident fluoride varnish applications.

Abstract #27: CURRENT STATE OF COMMUNICATION AMONGST GENERAL SURGERY RESIDENTS

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Introduction: A personal communication revolution has occurred with the advent of personal cellular phones and computers. Many individuals have adopted these personal communication modalities, while healthcare applications have not been clearly defined. Although surgical residents are required to develop healthcare-specific communication skills, the role of modern communication modalities has not been addressed. The purpose of this study was to evaluate the current state of communication amongst resident physicians within a General Surgery training program. A secondary objective was to evaluate if communication modalities have an association with resident well-being.
Methods: A cross-sectional survey was performed of General Surgery resident physicians at a single academic institution. A survey instrument was designed and distributed to evaluate resident usage of in-person, traditional phone calls, traditional paging, text messaging, and smartphone-based application messaging. The survey included an assessment of communication modality impact on burnout using the Well-Being Index with a validated cutoff of at least 5.
Results: We received 16 responses from the 20 surveyed residents (80%). All respondents reported owning a smartphone with 31% (5 of 16) not personally paying for smartphone data plans. 63% (10 of 16) reported a smartphone-related monthly data limit, of which 25% (4 of 10) reported exceeding within the previous year. Respondents reported a trend towards increased usage of traditional phone calls (75%), traditional paging (75%), text messaging (75%), and in-person (63%) compared to smartphone-based application messaging (19%). Residents reported no difference between healthcare and non-work settings, except for a lower usage of traditional paging (75% vs 13%; $p < 0.001$). Residents ranked the most preferred communication modalities for healthcare setting as in-person (81%), traditional phone calls (50%), text messaging (37.5%), traditional paging (25%), and smartphone-based application messaging (6%). In contrast, residents ranked the least preferred communication modality as smartphone-based application messaging (94%), traditional paging (56%), text messaging (31%), in-person (13%), and traditional phone call (6%). Residents most commonly reported the highest frequency communication modality for communication with other residents and with surgery attendings as text messaging (100% and 81%). Traditional paging was most commonly used with non-surgery attendings (56.3%) and traditional phone calls with nursing and other healthcare professionals (87.5%). Residents reported a low association of communication modality with respect to burnout (6.7%).
Conclusion: Several personal communication modalities have become integrated into General Surgery resident healthcare communication. This study demonstrates a need for improved training on appropriate usage of communication modalities within modern resident training programs.

Abstract #40: INTEGRATING DIABETES SELF-MANAGEMENT SUPPORT INTO A PREEXISTING CLINICAL WORKFLOW

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While self-management support is an important component of a successful primary care model, it can often be difficult to integrate novel models of patient-centered care into an existing academics-based practice. The OU-Tulsa Family Medicine Clinic is undergoing a redesign process informed by the "10 Building Blocks of Primary Care Clinics" and "Comprehensive Primary Care + Initiative". OU-Tulsa Family Medicine Clinic has implemented a new diabetes self-management support (SMS) workflow into the existing clinical structure. The workflow was implemented in April 2018 starting with a training for all clinical staff and physicians. In-depth training and one-on-one support (trainer-trainee) was conducted with the nurse care managers (responsible party) (N=3) in the following 6 weeks.
Immediately following education and implementation, the workflow was assessed at 4 unique points to assess for fidelity for the first 15 patient interactions through direct clinical observation:
1. Care team huddles during which SMS candidates were to be identified
2. Warm hand-offs between physicians and care managers to initiate self-management support.
3. Administration of a self-efficacy questionnaire by care managers participating in SMS
4. Execution of self-management support and goals set by participating patients
Within these first 15 patient interactions, no warm hand-offs were performed between physicians and care managers and providers did not explain self-management support during any of these encounters. Self-efficacy assessments were administered by care managers in 14 out of the 15 encounters and in 12 of these interactions, patients expressed difficulties performing the assessment. Care managers used the patient-centered language discussed in SMS training in 14 out of the 15 interactions, and common goals for diabetes self-management included walking 20-30 minutes daily during lunch break, elimination of sodas and sugary drinks, and reduction of breads in the diet.
Changes based on these initial observations and evaluation included expansion of the target patient population for self-management support, additional instruction for an effective warm hand-off between physicians and care managers, and the introduction of a new self-efficacy assessment that takes into account the varying levels of health literacy in the OU-Tulsa Family Medicine Clinic population. These changes have informed the next levels of implementation of self-management support in conjunction with the Comprehensive Primary Care (+) Initiative, including SMS workflows for chronic obstructive pulmonary disease and hypertension.

Abstract #72: IMPROVING REGISTRATION FOR INTERNAL MEDICINE CLINIC PATIENT PORTAL: A QUALITY IMPROVEMENT INITIATIVE

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Dr. Kory Drake - University of Oklahoma – Tulsa
Dr. Christopher Fisher - University of Oklahoma – Tulsa
Ms. Lindsey Gusman - OU Physicians - Tulsa
Ms. Lindy Sullins - OU Physicians - Tulsa
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Dr. Martina Jelley - OU-Tulsa
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Background: The universal adoption of electronic health records was a goal set by the US Institute of Medicine in 2009 to achieve the triple aim of reducing costs, increasing access, and improving quality. At our academic internal medicine clinic, we currently utilize an electronic patient portal to meet meaningful use measures, including secure patient messaging, transmission of patient health information, and use of personal health questionnaires. However, many patients have not enrolled in the portal. Our aim was to increase the total portal registration by 20% by May 2019.
Methods: We determined the areas of highest impact for increasing portal registration using a scatter diagram and gap analysis. A process flow map was created to evaluate possible areas of intervention. We implemented the changes via the Plan-Do-Study-Act (PDSA) model for improvement.
PDSA #1: During routine phone calls, two clinic care managers reminded patients to register for the portal.
PDSA #2: Front desk staff explained the use of the portal upon patient arrival.
PDSA #3: Flyers explaining the patient portal and registration method were given to patients at the end of appointments.
Data was collected during PDSA cycles, including the primary endpoint of percentage of patients enrolled and secondary meaningful use endpoints. Front desk staff were surveyed.
Results: Within the first month, portal utilization improved as the percentage of new patient enrollment increased from 6.9% to 10%, the number of secure messages sent increased from 71 to 101, and the number of “Ask a Staff” questions increased from 70 to 160. Qualitative data was also collected by front desk staff during the second PDSA cycle. They indicated an improved response to provision of emails for registration. However, patient receptivity appeared largely dependent on age, with younger patients more likely to provide an email address and complete registration.
Conclusion: Our project indicates that portal registration and utilization will likely continue to increase by integrating a multidisciplinary marketing approach into the clinical workflow. However, certain limitations may exist including patient access to the internet. Ultimately, increasing patient portal registration should lead to increased adoption of the system and improvements in cost, access, and quality of healthcare.

Abstract #77: CARPE DIEM MEDIUM: MAKING THE MOST IMPACT IN AN ACADEMIC HALF DAY

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Background: There are a variety of challenges to providing meaningful and relevant education to pediatric residents, including adapting to different adult learning styles, availability of lecturers, and balancing protection of educational times and coverage of patient care. In 2015, our program noticed a decline in our board pass rate to 20% for this graduating class, which lowered our three year pass rate for first time takers to 65% for 2013-15. Our educational goal was to improve in training exam (ITE) standard scores to national average and improve first-time-taker board pass rates to meet 3 year pass rate of at least 80% by 2019 and 100% by 2021.
Methods: We used serial PDSA cycles with change processes during academic afternoon sessions from 2015 through 2019. In 2015-16, we initiated a standardized 18-month curriculum. In 2016-17, we revised the curriculum, focusing on American Board of Pediatrics (ABP) content specifications and providing residents with standardized pre-reading materials. In 2017-18, we adjusted the curriculum to 12-months and started to follow residents' progress and assess knowledge gaps using an online pediatric question bank. This also helped us track residents considered at risk for board failure. We trended ITE scores and first-time-taker ABP board pass rates to measure effectiveness in changes to academic afternoon.
Results: When tracking ITE scores, our intern class in 2015 had a score 9 points below national average, and in their third year closed that gap to 3 points below. The intern class from 2016 averaged a 16 point deficit, which improved to a 4 point deficit in 2017, and surpassed the national average by 2 points in 2018. In regards to first-time-taker board pass rates, we had rates of 20% (1/5 residents) for 2015, 83% (5/6) for 2016, 83% (5/6) for 2017, and 100% (7/7) for 2018, including several deemed at risk for failure. Our 3 year first-time board pass rate increased to 85% for 2016-18.
Conclusion: Academic half days do pose challenges in regards to scheduling patient care coverage and faculty lecturers; however, our utilization of academic half days has been successful and well received by our residents. We have shown significant improvement in ITE scores and board pass rate with minor changes each year. Our next PDSA cycle incorporates weekly board review for the third year residents and a longitudinal developmental/behavioral/psychiatric curriculum for first and second year residents.

Abstract #87: TELEMETRY: REDUCTION IN UTILIZATION IN THE INPATIENT SETTING

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Background: Cardiac telemetry, or continuous cardiac monitoring (CCM), allows hospital providers to monitor for life-threatening cardiac arrhythmias with the goal of facilitating quicker treatment times (Weinberg, 2017). While arrhythmia detection, ischemia surveillance, and QT monitoring are all advances of telemetry, disadvantages include lack of specificity and provider alarm fatigue/desensitization (Lacy et al., 2015). Additionally, telemetry is a finite resource that has associated costs including not only monitoring equipment, but also trained interpreting staff. Misuse of telemetry levies unwarranted financial burdens on patients as well as the healthcare system as a whole. However, proper implementation of telemetry guided by education-driven interventions has been shown to decrease length of stay (LOS) and consequently cost (Svec et al., 2015). We intend to improve adherence to American Heart Association (AHA) telemetry guidelines in internal medicine residents. Two internal medicine resident-based inpatient teams were evaluated on proper telemetry use.
Method: PDSA #1: The teams were educated on AHA telemetry use guidelines. The wards team then reviewed patient criteria to determine appropriateness of emergency department physicians' initial telemetry/non-telemetry orders at admission and made adjustments as needed.
PDSA #2: Daily evaluation of telemetry or non-telemetry status was then performed each day during hospitalization by addition of telemetry to progress notes. Data was collected via daily written logs after progress notes were reviewed for telemetry documentation. Outcome data was then evaluated by evaluation of total % of patients on telemetry and units per resource case.
Results: We received pre-intervention, baseline data that showed an average of 64.2% (CI 54.9-73.5) of patients admitted utilized telemetry. Of those patients, the average telemetry use was 4.5 days (CI 2.99-6.01). Residents were surveyed on their individual evaluation of their own compliance with the telemetry protocol and improvement in daily evaluation of telemetry needs; many felt the flow chart and AHA signs were easy to follow and helped make decisions. Our goal is that after at least 4 months of PDSA cycles the post-intervention data will show a 10% decrease of both average percentages in telemetry use.
Conclusion: We expect the results from our study will show improvement in telemetry evaluation at admission and daily needs per resident team. We expect to show outcomes of decreased telemetry use by AHA guidelines at SJMC by May 2019.

Abstract #93: IMPROVING OUTPATIENT FOLLOW UP AFTER HOSPITALIZATION

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Introduction: Hospital readmission is costly in terms of patient well-being and quality of life, as well as healthcare expenditures[1]. Timely post-discharge follow-up has shown to reduce preventable readmissions[2]. Efforts should be aimed at improving coordination of follow-ups[3].
The aim of this quality improvement project is to increase post-hospital discharge follow-ups by 20% for academic primary care patients admitted to a local tertiary care hospital by May 2019.
Methods: This quality improvement project was conducted at St. John Medical Center and the OU Internal Medicine Clinic utilizing Plan-Do-Study-Act methodology. OU patients on the inpatient OU teams were included. Each inpatient team maintains a list of currently admitted patients in the HIPAA-compliant application "ListRunner". A process map was made showing points of intervention. An EMR query was utilized to measure follow ups completed within 14 days of discharge at the clinic in 2018. Gap Analysis/Scatter Diagram was used to show points of largest impact.
PDSA #1: A senior resident was assigned the daily task of calling the discharge coordinator to obtain a 14-day appointment for all OU admissions. The senior updated ListRunner with appointments.
PDSA #2: Access to ListRunner was granted to discharge coordinators who assessed Listrunner daily, establishing 14-day follow-up appointments. Follow-up appointments were included in patients' discharge paperwork.
Results: Results of PDSA #1: Residents surveyed after the first PDSA cycle admitted feeling overwhelmed with tasks and inconsistently called the discharge coordinator. Due to these results, we sought alternative options to remove the extra tasks for the senior.
Results of PDSA #2: After Listrunner access was granted to the discharge coordinator, appointments at time of discharge increased dramatically. Verbal survey revealed barriers to the process. Recommendations included ensuring double-identifiers were included on Listrunner for all patients. Additionally, adding a Follow-Up section to Listrunner was recommended to ensure follow-up appointments were not inappropriately removed.
Discussion: The low rate of hospital discharge appointments within 2 weeks of the hospitalization indicates many patients are lacking much needed follow-up care. This project found shared access to a HIPAA-compliant application was helpful in increasing total number of patients given a hospital discharge appointment within 14 days. During this QI project, removing responsibility from senior residents as well as improving communication with the discharge coordinator improved outcomes. We are analyzing data over the next 4 months to determine whether this directly impacts hospital follow-up rates. Future analysis of secondary outcomes will include reduction of hospital readmissions.

Abstract #97: REDUCING UNNECESSARY EMERGENCY ROOM VISITS: A QUALITY IMPROVEMENT INITIATIVE

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Background: Emergency room visits place a strain on the medical community and its resources. Many of these visits could be adequately addressed through primary care office visits and triage phone calls, resulting in lower healthcare costs.
Methods: This quality improvement project involved analyzing emergency room visits by our Medicaid insured pediatric population before and after three cycles of intervention. The improvement goal was to decrease unnecessary emergency room visits in 2018 compared to the same months in 2017. For the first cycle of intervention, June 2018, flyers with a 24 hour triage number that families could utilize for health care questions were placed in every pediatric clinic examination room. For the second cycle, July 2018, in addition to the posters an acute care clinic was opened by the pediatric primary care clinic, providing appointments 2 days per week. For the third cycle, Aug-Dec 2018, in addition to the posters the acute care clinic was expanded and offered every day of the week. Emergency room data was expressed as ER visits per Medicaid population per month to reflect monthly and annual fluctuations in Medicaid patients receiving primary care from the clinic. Emergency room diagnoses were reviewed by three pediatric providers and determined to be necessary, unnecessary, or indeterminate. Average cost for emergency room visits was determined using Medicaid claims data.
Results: Cycle one data showed a 15% increase in total emergency room visits per patient per month in 2018 compared to 2017. Cycles two and three showed a decrease in patient visits by 0.25% and 7.6% respectively. Unnecessary visits from 2017 to 2018 showed an increase of 6% in cycle one and a decrease of 13% and 11% in cycles two and three respectively. Medicaid payout for ER visits by our patient population decreased by $457,141 in 2018 even though our patient population increased by an average of 569 patients in 2018.
Conclusion: Our quality improvement findings showed that poster placement as a sole process was not effective in preventing and decreasing unnecessary utilization of the pediatric emergency center. However, improvements in the pediatric emergency center utilization by our panel of clinic patients were noted with the addition and further extension of acute care hours at the primary care site.

Abstract #105: QUALITY IMPROVEMENT PROJECT TO IMPROVE HPV VACCINATION RATES

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Introduction: Approximately 42,670 people in the US are diagnosed with a human papillomavirus (HPV)-associated cancer each year. Screening guidelines exist for cervical cancer, but there are none for other HPV-associated cancers. According to the CDC, HPV vaccination could prevent development of 90% of these cancers. Vaccination remains the single most important factor in preventing HPV-related cancers. The CDC recommends most adolescents, age 9-14 years, receive a two-dose vaccination series on a 0, 6-12 month schedule, while patients 15 years or older should receive a 3-dose series at 0, 1-2 months, 6 months. The aim of this project was to increase second dose HPV vaccination rates for patients between the ages of 9-12 years.
Methods: An EMR query was conducted to collect baseline data on OU Family and Community Medicine SoonerCare patients' age 9-12 years between 07/01/2017 and 06/30/2018, who received the HPV vaccine. This PDSA cycle aimed to improve second dose vaccination rates by sending a text reminder to patients to schedule an appointment. This could not be completed due to technical issues with the reminder system so clinical staff made reminder calls to patients. A repeat query will be performed to compare impact of the calls to baseline data.
Results: Baseline data showed SoonerCare patients age 9-12 years between 07/01/2017 and 06/30/2018 had first dose HPV vaccination rates of 70.1% (467/666), but a second dose HPV vaccination rate of only 3.6% (17/666). 463 patients were identified for intervention; 55 were called on 11/20/18 and 11/28/18. Of the 55 patients called, 8 expressed interest in using the walk-in clinic to obtain the vaccination, 25 stated they had completed the series, and 3 declined the recommendation.
Discussion: The query showed that our clinic's first vaccination rate is comparable to the US average (66%), whereas our vaccine completion rate was drastically lower than the US average (49%). However, data from this study found that 45% of patients called had already received their second vaccination. This may demonstrate the need for a more detailed operating procedure that results in more accurate documentation of HPV vaccination series in the EMR. The next PDSA will educate the immunization nurses on the process to correctly document the doses of vaccination series in the EMR. We believe that increasing the accuracy of HPV vaccine series documentation in the EMR will improve the ability to evaluate the data and develop future interventions.

Abstract #106: APPROPRIATE OFFICE VISIT CODING IN FAMILY MEDICINE: ARE YOU GETTING WHAT YOU DESERVE?

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Introduction: Appropriate billing for routine office visits in the primary care setting is often overlooked by physicians. A study completed in 2005 found that Family Medicine (FM) physicians often "reflexively code a routine office visit as a 99213", leading to lost revenue for both the employer and physician. As FM physicians, we typically manage patients with multiple co-morbidities as well as manage appropriate preventative screening within each office visit. Since we practice in a hybrid of fee-for-service and quality physician reimbursement system, it is important for FM physicians to bill accurately. The goal of this project was to increase resident billing of appropriate 99214 office visits by 10% over baseline by February 2019 through education and awareness of the criteria for a Level 4 office visit.
Methods: The project was conducted at an academic primary care clinic, using clinical dashboard data reporting the percentage of 99214 office visits billed for all residents. Baseline data was obtained during the month of July 2018, followed by the implementation of two educational PDSA cycles regarding resident education of 99214 billing requirements. In August the medical director presented a didactic learning opportunity, followed in December by peer-to-peer education and distribution of 99214 criteria cards. Dashboard data to evaluate the impact of the PDSA cycles on 99214 billing was collected and analyzed on a monthly basis from August 2018 through December 2018.
Results: At baseline, 41% of resident office visits were coded as a 99214. After the first PDSA cycle, a slight improvement to 43% was observed. In September, billing reached 45%, a 10% increase over baseline, and it continued to increase to 48% in November. After the second PDSA cycle, 99214 billing returned to baseline levels of 41%.
Discussion: Through verbal communications, residents reported a greater understanding of 99214 billing criteria and systematically increased their 99214 billing percentage. A decrease in 99214 billing in December was likely secondary to increased acute visits requiring lower medical decision-making. Data will continue to be monitored to see if there has been a sustainable improvement. Currently a third PDSA is being conducted to address Attending availability that was identified by the residents as a barrier to appropriately billing for a 99214.