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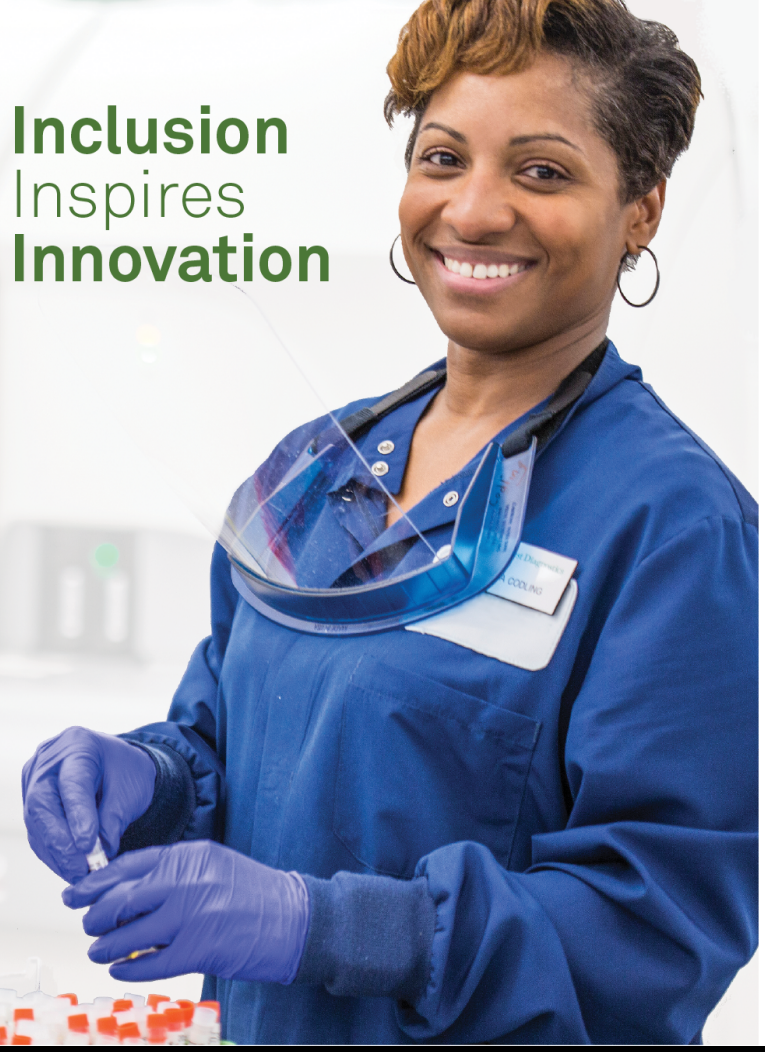

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Posters

Aging / Alzheimer's Disease (Abstracts in the 100s)

100 – Poster **Classification:** TCOM DO Student
Presenter: Ranna Al-Dossari **Department:** Institute for Healthy Aging
Authors: Ranna Al-Dossari, UNT Health Science Center; Vicki Nejtek, UNT Health Science Center; Jerica Lomax, UNT Health Science Center

Protective Factors and Risks for TIA/Stroke in Senior vs. Young Adults

Background: Since 1995, transient ischemic attacks (TIA) and strokes in seniors (55-84-years) have substantially declined, while risks have tripled in young adults (18-44-years). Traditional TIA/stroke risks include hypertension, cardiovascular disease, diabetes, smoking, and obesity. Protective factors explaining the decline of TIA/stroke in seniors are unclear. Previously, we found young adults with moderate/high (MH) risk had higher body and truncal fat, more stress, less coping abilities, and had worse memory recall than their low/no (NL) risk counterparts. To determine if these novel risks are present in seniors, we compared them to young adults to identify resilience or vulnerability for TIA/stroke in both age groups.

Hypothesis: Anthropometric, psychological and cognitive (APC) outcomes will be protective factors for seniors and risk factors for young adults.

Methods: A proof-of-concept study was designed and conducted on campus. Those eligible were young adults (20-45-years) and seniors (50-80-years) of all race/ethnicities with a minimum of 16-years education. Medical history, demographics, and anthropometric data were collected. Stress, coping, and nonverbal memory were assessed with standardized tests. Nonverbal memory using a percent retention score (PRS) was calculated from the Rey-Osterrieth Complex Figure. Descriptive statistics, frequency distributions, ANOVA with post hoc corrections for multiple comparisons and regression modeling were used with a 95% confidence interval for significance.

Results: Seniors (n=25), young adults with MH (n= 23) and young adults with NL (n=27) risks for TIA/stroke participated in the study. Anthropometrics were higher in seniors than either young group ($p<0.005$). Seniors had similar PRS as both young groups. Seniors had less stress ($p<0.05$) and better coping skills ($p<0.03$) than either MH or NL adults. Stress ($t=2.21$, $p=0.03$) and coping ($t=2.42$, $p=0.02$) significantly predicted PRS ($F(2,74)=3.22$, $p<0.05$).

Conclusions: These data suggest that seniors' retention of nonverbal memory is comparable to young adults with NL TIA/stroke risks. High stress and poor coping have been associated with traditional TIA/stroke risks and impaired memory. Reduced stress and better coping in seniors indicate resilience and may be considered protective factors. These data should be interpreted with caution as further research is needed with a larger sample.

Sponsor: N/A
IRB/IACUC#: 2015-003

101 - Poster **Classification:** SPH Student

Presenter: Rafiu Animashaun **Department:** Behavioral & Community Health

Authors: Rafiu Animashaun, UNT Health Science Center; Brad Cannell, UNT Health Science Center; Jennifer Reingle Gonzales, UNT Health Science Center; Doug Livingston, UNT Health Science Center; Katelyn K. Jetelina, UT Southwestern

Pilot Testing a Brief Elder Abuse and Neglect Screening Tool for Emergency Medical Services: Results from the DETECT Project

Objective: To pilot test and evaluate the effectiveness of a brief elder abuse and neglect screening tool (DETECT) for Emergency Medical Services.

Methods: The DETECT screening tool was pilot tested from September 17th, 2015 to October 27th, 2015 at a large mobile healthcare provider in North Texas. During this testing period, all medics were prompted to complete the DETECT tool when responding to a call for a community-dwelling patient who was 65 years of age or older. If the DETECT tool indicated a suspected cases of elder abuse, medics were instructed to contact APS. . The frequency of change in medic reporting to APS was evaluated, along with the predictive performance of the individual screening items.

Results: The DETECT screening tool was successfully pilot tested for more than a month. Following the introduction of the DETECT screening tool, there was a 152% improvement in reporting rates with an increase of 3.6 ($p < 0.0001$) validated reports per month. Overall, the false discovery rate for DETECT cases was 6% -- well below the 33% threshold of false-positive reports made to APS by all other parties.

Conclusions: Our study provides support for DETECT as an effective intervention for enhancing medics' ability to identify and report EA.

Sponsor: Department of Justice
IRB/IACUC#: 2015-120

102 - Poster **Classification:** School of Health Professions Student

Presenter: Erica M Chustz **Department:** Physician Assistant Studies

Authors: Erica Chustz PA-S, UNT Health Science Center; Silas Luna PA-S, UNT Health Science Center; Ashley Naguit PA-S, UNT Health Science Center; Kirk W. Barron PhD, MHS, PA-C, UNT Health Science Center; Jessica L. Hartos PhD, UNT Health Science Center

Is Chronic Alcohol Use a Risk Factor for Cognitive Impairment in Elderly Women?

Introduction: Cognitive impairment and alcohol consumption are both significant health concerns in the United States; however, there is insufficient research regarding a possible relationship between these two variables in women and the elderly. Based on these gaps in the literature, the purpose of this study was to assess whether there is a relationship between alcohol consumption and cognitive impairment in women aged 55-64.

Methods: This cross-sectional analysis used 2014 BRFSS data for females ages 55-64 from AL, AR, KY, and MS. Multiple logistic regression analysis was used to assess the relationship between heavy alcohol use and cognitive impairment, while controlling for education level, employment status, income level, history of stroke, weight, and ethnicity.

Results: A minority of the target population reported cognitive impairment, defined as serious difficulty concentrating, remembering, or making decisions in the last 30 days (17-21%), and an even smaller minority reported heavy alcohol use of 1+ drinks daily (2-5%). After controlling for demographic factors, medical history, and socioeconomic status, cognitive impairment was not significantly related to alcohol use in any of the 4 states.

Conclusions: In adjusted analyses, cognitive impairment was not significantly related to alcohol consumption in females aged 55-64 in any state. Education level, employment status and income level were all inversely related to alcohol consumption in all states. This study was unable to obtain any history of the patients' alcohol use or cognitive impairment over time. Primary care providers may not need to screen for cognitive impairment or chronic alcohol use in women aged 55-64, unless indicated by patient presentation, since these conditions are low prevalence, and providers should should be aware of possible relations between cognitive impairment and education level, employment status, and income.

Sponsor: N/A
IRB/IACUC#: 2016-074

103 - Poster **Classification:** Faculty (Not for Competition)
Presenter: Lesca Hadley, MD **Department:** Geriatrics
Authors: Lesca Hadley MD, JPS Health Network; Richard Young MD, JPS Health Network; Janice Knebl, UNT Health Science Center; Jennifer Severance PhD, UNT Health Science Center; Don Smith, United Way's Area Agency on Aging of Tarrant County; Subhada Prasad MHA, UNT Health Science Center; Jessica Hartos PhD, UNT Health Science Center

Development of A Geriatric Training Certificate For Family Medicine Residents

Background: With a lack of Geriatricians, Family Physicians must be prepared to care for older adults and provide team-based care in different settings. However, geriatric training for Family Medicine Residents is inconsistent, and their comfort level in caring for elderly patients varies. To expand the Family Physician's understanding and collaboration with community partners in geriatrics care, Family Medicine Residency Programs at JPS Health Network and Plaza Medical Center integrated community-based experiential learning modules into Y2 and Y2 curriculum as part of a new Geriatric Certificate.

Methods: Residency Directors at JPS Health Network, Plaza Medical Center and UNT Health Science Center, faculty, and representatives from community organizations identified evidence-based practices providing experiential opportunities for residents. The enhanced curricula includes a 4-hour home visit with a Meals on Wheels client; a 4-hour home visit with an Alzheimer's Association patient and caregiver; a 1-hour group session for A Matter of Balance fall prevention program; and a 1-hour Virtual Dementia Tour. Residents completed evaluation surveys using a 5-point Likert scale to assess the quality of training, knowledge of older patient needs, and attitudes towards geriatric patient care. After pilot testing the modules with Geriatric Fellows in the Spring 2016, the modules were implemented with Family Medicine Residents in Fall 2016.

Results: 12 Family Medicine Residents completed Meals on Wheels home visits, 10 completed Alzheimer's Association home visits, and 57 completed the Virtual Dementia Tour. 13 Plaza Medical residents completing the Virtual Dementia Tour completed evaluation surveys, and reported gaining confidence in their knowledge of healthcare needs, and increasing in knowledge of services for older patients. They also reported increased confidence in talking with older adults about needs and services. 92% recommended the training. Qualitative feedback revealed major themes, including residents' increased awareness of patient care considerations, caregiver roles and greater appreciation for working with older adults.

Conclusions: Results suggest that Family Medicine Residents benefit from experiential geriatrics training developed in partnership with community based organizations.

Sponsor: Health Resources and Services Administration Geriatric Workforce Enhancement Program U1QHP28735
IRB/IACUC#: N/A

104 - Poster **Classification:** Staff (Not For Competition)

Presenter: Subhada Prasad, MHA **Department:** Geriatrics

Authors: Diane Hawley, Texas Christian University; Thomas Fairchild, UNT Health Science Center; Janice Knebl, UNT Health Science Center; Don Smith, United Way's Area Agency on Aging of Tarrant County, Inc.; Jennifer Severance PhD, UNT Health Science Center; Subhada Prasad MHA, UNT Health Science Center; Jessica Hartos PhD, UNT Health Science Center

Geriatric Leadership Training For Health Professionals In Emerging Health Systems

Background: Increasingly integrated health delivery systems require that healthcare practitioners work effectively in interprofessional teams and lead change in emerging health care environments. To prepare the next generation of leaders and in transforming geriatric systems of care, the University of North Texas Health Science Center, Texas Christian University's Nursing and Business Schools and the United Way's Area Agency on Aging of Tarrant County partnered together to develop a ten-month Geriatric Practice Leadership Institute (GPLI).

Methods: Applying a Rapid Cycle Quality Improvement Approach, faculty developed curricula for three two-day sessions held in October, November, and December 2016. Curricular content focused on five domains: 1) Leading Self; 2) Leading Teams, 3) Leading Organizational Change, 4) Population Health Science, and 5) Aging Network and Healthcare Delivery for Older Adults. Six teams of 27 healthcare professionals were selected from JPS Health Network, Texas Health Resources, UT Southwestern, UNT Health Science Center, Brookdale Senior Living, and The Women's Center. Teams developed a geriatrics-related quality improvement project in their areas of practice. Projects focused on caregiver support, combating isolation, fall prevention, and improving electronic health records systems. Coaches support project development. Evaluation surveys were completed by participants at the end of each session to assess the quality of the training, and its impact on project development, implementation, and professional practice.

Results: The majority of respondents agreed the sessions were helpful for personal mindfulness of leadership attributes and skills, and in developing, implementing and evaluating their quality improvement projects. Qualitative responses indicate the trainees intend to make changes to their professional practice as a leader and team member. Comments include changes to "better define roles in the group setting to improve outcomes and efficiency" and "engage stakeholders." Comments related to projects include changes "in the scope of the project to something more manageable and suited for our resources," and to "identify the obstacles that may affect the success of the project." 92% would recommend the training.

Conclusions: Enhancing health professionals' personal leadership skills can create meaningful interventions designed to improve geriatrics care in primary healthcare systems.

Sponsor: Health Resources and Services Administration's Geriatric Workforce Enhancement Program
IRB/IACUC#: N/A

105 - Poster **Classification:** Staff (Not For Competition)
Presenter: Haydee Izurieta Munoz **Department:** Institute for Healthy Aging
Authors: Haydee Izurieta Munoz, UNT Health Science Center; Leigh Johnson, UNT Health Science Center; Sid O'Bryant, UNT Health Science Center

Relationship Between Uncontrolled Diabetes and Cognition in Mexican American Elders

Hypothesis: Diabetes affects approximately 29.1 million Americans with Mexican Americans being twice as likely to be diagnosed with diabetes. Diabetes is considered a modifiable risk factor for Alzheimer's disease and cognitive decline. Several studies have shown a link between diabetes and an increased risk of the progression from mild cognitive impairment to Alzheimer's disease. Although diabetes' role in cognition is an emerging topic, the majority of research examining diabetes and cognition has focused on non-Hispanic populations. The purpose of this research was to examine the impact of diabetic control on cognition in Mexican Americans. This study was designed to evaluate differences in cognition among controlled and uncontrolled diabetics without cognitive impairment. Past research analyzing the effects of glycemic control on cognition have shown that adults with normal cognition and high HbA1c performed worse on memory and cognition tests than their lower HbA1c counterparts.

Methods: Data were obtained from 171 Mexican American participants with diabetes (61 uncontrolled; 110 controlled) enrolled in the Health and Aging Brain among Latino Elders (HABLE) study, a longitudinal study of cognition in elderly Mexican Americans. All participants were classified as having normal cognition. Uncontrolled diabetes was defined as HbA1C levels 9 or greater. Fasting venous blood was drawn from study participants to obtain HbA1C levels and measure long term glycemic control. Cognition level was determined by participant performance on multiple neuropsychological tests evaluating numerous domains of memory: visuospatial, attention, immediate memory, delayed memory and executive function.

Results: Independent t tests were conducted to compare cognition among controlled and uncontrolled diabetics. Uncontrolled diabetics performed worse on WMS digit span $t(167)=2.1$, $p<.05$, EXIT 25 $t(106)=-2.1$, $p<.05$, and MMSE $t(169)=2.9$, $p<.005$. Uncontrolled diabetics were significantly younger $t(169)= 3.6$, $p<.005$.

Conclusions: Uncontrolled diabetes was associated with poorer performance in the areas of attention and executive functioning among cognitively normal Mexican Americans. No differences were found in immediate and delayed memory, and visuospatial scores. Ongoing work will determine if these links are associated with neuroimaging and other biomarker signatures that may identify those Mexican Americans at greatest risk for cognitive loss associated with poor diabetic control.

Sponsor: N/A
IRB/IACUC#: 2012-083

106 - Poster **Classification:** Faculty (Not for Competition)
Presenter: Daniel Metzger **Department:** Institute for Healthy Aging
Authors: Marianna Jung, UNT Health Science Center; Daniel Metzger, UNT Health Science Center

Chronic BZD Perturbs Mitochondrial Membrane Proteins and Provokes the Aging Like Effect on Motoric Function

Purpose: Benzodiazepines (BZDs) are CNS depressants and are among the most commonly prescribed medications to treat hyperexcitatory disorders such as insomnia. However, its high or a repeated dose is frequently administered to patients who are resistant to the therapeutic effects of BZD. A high or a repeated dose of BZD often provokes side effects including respiratory suppression and motoric impairment which can be more severe in elderly than young persons. Here, we investigated the adverse effects of BZD (lorazepam) on the integrity of mitochondria in the brain of mice.

Methods: Young adult male mice were injected with BZD (1 mg/kg) for 14 days and tested for motoric function using Rotarod. Older mice (12 months old) were injected with a vehicle for 14 days and tested for Rotarod test. Mice were then euthanized to collect a whole brain. The expression of mitochondrial membrane proteins such as mitochondrial (peripheral) benzodiazepine receptor (PBR), mitochondrial creatin kinase (mCK), and cytochrome c oxidase (COX) was measured in the prefrontal cortex using the immunoblot method.

Results: Compared to young control mice, young mice injected with chronic BZD showed poorer Rotarod performance by more quickly falling from Rotarod. The latency to fall from Rotarod of younger BZD mice (3 months old) was as short as that of older control mice (12 months old). Young mice injected with chronic BZD showed an increase in the expression of PBR and COX and a decrease in mCK.

Conclusions: These data suggest that a chronic dose of BZD can facilitate the aging process through damaging the integrity of mitochondrial membranes. Supported by NIH/AA018747.

Sponsor: NIH/AA018747
IRB/IACUC#: IACUC-2016-0035

107 - Poster **Classification:** Dual Degree student

Presenter: Victoria Kowalewski **Department:** Physical Therapy

Authors: Victoria Kowalewski, UNT Health Science Center; Linda Thibodeau, University of Texas at Dallas; Rita Patterson, UNT Health Science Center; Jordan Fox, UNT Health Science Center; Brenda L. Kinzler, UNT Health Science Center; Nicoleta Bugnariu, UNT Health Science Center

Contribution of Auditory Inputs to Balance in Young and Older Adults

Hypothesis: Traditionally, 3 sensory inputs (visual, vestibular, and somatosensory) are associated with the control of balance and have been investigated for their potential contribution to increased risk of falls. Recent evidence suggests auditory inputs may also contribute to balance control. Although current evidence reveals an association between hearing loss and balance difficulty, the mechanisms behind how and why hearing loss affects balance are unknown. We investigated the contribution of auditory inputs to balance control in healthy young and older adults by simulating hearing loss,

Methods: Twenty healthy young and older adults, cleared of any sensory and neurological deficits participated in the study. Participants completed 1 min standing balance, walking, and responding to 10 perturbations at $2m/s^2$ in AP direction while completing a standardized audiology test (BKB-SIN). The audiology test required the subject to repeat back sentences played through the headphones under normal hearing (control) and simulated hearing loss conditions, randomly assigned. Simulated hearing loss was achieved using a pair of Bose QuietComfort 35 wireless noise-cancelling headphones. Adobe Audition was used to simulate moderate hearing loss. Outcomes included: Center of Pressure (COP) sway variability, number of compensatory steps, COP-COM during first compensatory step after perturbation, performance of auditory task, and self-selected gait speed. Clinical physical therapy outcome measures were also administered. ANOVA was conducted for each of the dependent variables with respect to group and condition of auditory task.

Results: Compared to normal hearing, simulated hearing loss resulted in significantly increased COP sway variability significantly and more compensatory steps in response to perturbations in older adults. Preliminary results showed that in response to surface perturbations, the COP-COM distance was an average of 25cm and 15cm in young and older adults, respectively, reflecting the shorter, multiple steps taken by older adults.

Conclusions: Simulated hearing loss negatively impacts postural control particularly in dual-task conditions when individuals simultaneously attend to auditory and postural tasks. The effect is stronger in older adults who have fewer resources to compensate for poor sensory input. Individuals with hearing loss may be at greater risk of falling than individuals without hearing loss.

Sponsor: Supported by Neurobiology of Aging Training Program (National Institute of Health training grant – T32 AG 020494)
IRB/IACUC#: # 2016-099

108 - Poster **Classification:** TCOM DO Student

Presenter: Gladys Lopez **Department:** Geriatrics

Authors: Gladys Lopez, UNT Health Science Center; Jennifer Severance, UNT Health Science Center; Christina Bartha M.S., Senior Citizen Services of Greater Tarrant County Inc.

Impact of an Evidence-Based Fall Prevention Program Relayed by Physical Therapy Students on the Older Adult Population of Tarrant County

Introduction: A Matter of Balance (AMOB)/Volunteer Lay Leader (VLL) Model is an evidence-based fall prevention program for older adults. Each class consists of eight two-hour sessions designed to increase confidence in fall management and physical activity. Senior Citizen Services of Greater Tarrant County (SCSTC) hosts the program across Tarrant County and has partnered with the University of North Texas Health Science Center (UNTHSC) to train physical therapy students as lay leaders. This study uses pre- and post-survey data from older adult AMOB participants to evaluate the impact and effectiveness of this partnership during the 2016 year as a part of continuous quality improvement.

Methods: SCSTC collected data from program graduates using pre- and post-program evaluation surveys distributed at the beginning and end of each class. Surveys included the Falls Efficacy Scale (FES) to measure confidence in fall management. Class attendance logs provided information about class frequency, location and zip codes.

Results: Ten classes were held at eight senior centers and one senior housing community. 24 zip codes were served. 106 of 136 participants (78%) completed the program. The majority of graduates were between the ages of 65 and 74 (51%), female (85%), and Black or African-American (61%). 58 graduates listed their primary language as English, 2 listed Spanish, and 1 listed Filipino. The average number of classes attended by graduates was 7. Graduates averaged a higher FES score (3.22) than all of the enrollees (3.13) at the end of the program.

Conclusions: The averages FES scores for both enrollees and graduates increased, indicating that participants reported a greater level of confidence in managing falls. This finding confirms the efficacy of the VLL model of the AMOB program. The majority of graduates were women, African-American, and between the ages of 65 and 74. SCSTC's partnership with UNTHSC students was effective in delivering the AMOB/VLL program to older adults in Tarrant County.

Sponsor: Medical Student Training in Aging Research (MSTAR)
IRB/IACUC#: 2017-046

109 - Poster **Classification:** GSBS Student

Presenter: Samantha Mannala **Department:** Geriatrics

Authors: Samantha Mannala, UNT Health Science Center; Amanda Robbins, FWSCC Falls Prevention Task Force; Kathlene Camp, UNT Health Science Center; Jennifer Severance, UNT Health Science Center

Expansion of a Fall Prevention Home Assessment Program in Partnership with Faith Community Nurse Program

Background: With the Fort Worth Fire Department (FWFD) receiving approximately 3500 calls last year related to falls at home, collaborative efforts are needed to combat this high prevalence of falls in the community. Fort Worth Safe Communities Falls Prevention Task force (FPTF) expanded their fall prevention programs in the community by providing home and environmental safety education for faith communities. Members of the FPTF developed and evaluated a training for Faith Community Nurses.

Methods: Trainees were recruited by Texas Health Resources' Faith Community Nursing Program to participate in a three-hour training provided by the FPTF. Participants received information about fall hazards and community resources related to fall prevention. Participants received training on using the FWFD's home evaluation assessment tool and practiced using this tool to identify fall hazards in a room decorated to stimulate a home environment. Pre and post evaluation surveys asked trainees to assess the overall quality of the training, and rated their knowledge and skills using a pre-post 4-point Likert-scale.

Results: The participants rated their knowledge of fall risks, fall factors, the FWFD's home assessment tool and community resources that prevent falls before and after the training. In all areas, participants' knowledge and confidence level increased after the training. The biggest increase came in knowledge in using the home assessment tool, with the average on the 4-point scale, increasing from a 2.21 to a 3.77. The next largest increases came in awareness of the factors that lead to falls (3.00-3.62) and talking about community resources for preventing falls (2.50-3.15). The smallest increase came in identifying fall risks, which increased from a 3.07 to a 3.54. 78.5% of the participants also agreed or strongly agreed that they felt more confident and planned to continue helping older adults. 100% agreed or strongly agreed that they would recommend the training. Analysis of qualitative feedback indicated the resources provided in the training, and the sample fall room were very helpful in learning about falls.

Conclusions: Results suggest that Faith Community Nurses benefit from this training, based on the increases in knowledge of falls and confidence in helping older adults. This training will allow for expansion of the home safety assessment component to fall risk reduction in the faith community.

Sponsor: Fort Worth Safe Communities Falls Prevention Task force
IRB/IACUC#: 2017-017

110 - Poster **Classification:** TCOM DO Student
Presenter: Kate Pumphrey **Department:** Institute for Healthy Aging
Authors: Katherine Pumphrey, UNT Health Science Center; Michael Forster, UNT Health Science Center; Marjana Sarker, UNT Health Science Center

Neurobehavioral Effects of N-phenylactyl-L-proglycine Ethyl Ester on Improving Cognition in Older Adults

Background: Much of current research focuses on diminishing the decline of cognition in older adults.

Hypothesis: This study focuses on improving cognition in older adults, specifically using N-phenylactyl-L-prolylglycine ethyl ester (NPPEE), which is currently marketed in some countries to increase wakefulness.

Materials and Methods: In a preliminary study, we tested this compound for its potential to promote wakefulness in young mice. Male Swiss-Webster mice were injected via the intraperitoneal route with varying doses of NPPEE ranging from 0.1 mg/kg to 4.0 mg/kg, using deionized water as the vehicle. Immediately after injection, the mice were placed into the locomotor activity study for 8 hours to test for stimulant and possible anxiolytic effect, as measured by their horizontal activity and center times, respectively.

Results: In the first 10 minutes of the session, the mice injected with the NPPEE solution demonstrated significantly greater horizontal activity than those injected with deionized water only, but there was no effect on center time. This effect with horizontal activity was dose dependent, with 1 mg/kg having the maximum dose effect. These results suggest that NPPEE promotes wakefulness mildly. This effect was approximately 33% of the maximal stimulant effect of modafinil, which was tested as a standard. The next step is to examine the effects of NPPEE in mice on short term, working memory and cognitive flexibility using an active avoidance test.

Conclusions: Thus far, the results suggest that this compound has potential as a psychogeriatric stimulant medication, and although the anxiolytic effect in the younger mice was not significant, other literature suggests that the effect is significant in older populations.

Sponsor: N/A
IRB/IACUC#: 2016-0039

111 - Poster **Classification:** Postdoctoral Fellow

Presenter: Jinzi Wu **Department:** Institute for Aging & Alzheimer's Disease Research

Authors: Jinzi Wu, UNT Health Science Center; Xiaoting luo, Gannan Medical University; Liang-Jun Yan, UNT Health Science Center

Pancreatic Mitochondrial Complex I Exhibits Aberrant Hyperactivity in Diabetes

Purpose: The purpose of this study was to evaluate how pancreatic mitochondrial complex I responds to NADH/NAD+ redox imbalance and the possible consequences of such response in diabetic pancreas.

Methods: Type 2 diabetic mouse models were obtained from Jackson Laboratory. Type 2 diabetic rat models and healthy young Sprague Dawley rats were obtained from Charles River. Type 1 diabetes in mouse and rat was induced by intraperitoneal injection of streptozotocin according to published methods. Pancreatic mitochondria were isolated by gradient centrifugation method and enzyme assays were determined spectrophotometrically or by in-gel activity staining.

Results: We found that pancreatic mitochondrial complex I showed aberrant hyperactivity in either type 1 or type 2 diabetes. Further studies focusing on streptozotocin (STZ)-induced diabetes indicate that complex I hyperactivity was accompanied by increased activities of complexes II to IV, but not complex V. Moreover, in diabetic pancreas, reactive oxygen species production and oxidative stress increased while mitochondrial ATP production decreased, which was accompanied by impaired pancreatic mitochondrial membrane potential and increased cell death. Additionally, cellular defense systems such as glucose 6-phosphate dehydrogenase, sirtuin 3, and NQO1 were found to be compromised in diabetes.

Conclusions: Our findings point to the direction that complex I aberrant hyperactivity in pancreas could be a major source of oxidative stress and β cell failure in diabetes. Therefore, inhibiting pancreatic complex I hyperactivity and attenuating its ROS production by various means in diabetes might serve as a promising approach for anti-diabetic therapies, in particular, for type 2 diabetes.

Sponsor: N/A
IRB/IACUC#: 2014-1532

Biochemistry (Abstracts in 200s)

200 - Poster **Classification:** Postdoctoral Fellow
Presenter: Zhicheng Zuo **Department:** Pharmaceutical Science
Authors: Zhicheng Zuo, UNT Health Science Center

Does Cas9-Catalyzed DNA Cleavage Generate Blunt Ends or Staggered Ends? Insight from Molecular Dynamic Simulations

Background: The CRISPR-associated endonuclease Cas9 from Streptococcus pyogenes (spCas9) along with a single guide RNA (sgRNA) has merged as a versatile toolbox for genome editing. Despite recent advances in the mechanistic studies on spCas9-sgRNA-mediated target double-stranded DNA (dsDNA) recognition and cleavage, it is still unclear how the catalytic Mg^{2+} ions induce the conformation changes toward the catalytic active state. It also remains controversial whether Cas9 generates blunt-ended or staggered-ended breaks with overhangs in the target DNA.

Methods: To investigate these issues, here we performed the first all-atom molecular dynamics simulations of the spCas9-sgRNA-dsDNA system with and without Mg^{2+} bound.

Results/Conclusions: The simulation results show that binding of two Mg^{2+} ions at the RuvC domain active site could lead to structurally and energetically favorable coordination ready for the non-target DNA strand cleavage. Importantly, we argue that Cas9-catalyzed target DNA cleavage produces 1-bp staggered ends rather than generally assumed blunt ends.

Sponsor: N/A
IRB/IACUC#: N/A

Cancer (Abstracts in 300s)

300 - Poster **Classification:** TCOM DO Student
Presenter: Hailie Hampton Bell **Department:** Pediatrics
Authors: Hailie Bell, UNT Health Science Center; William Bowman, UNT Health Science Center

Case Study: Long-Term Effects of Treatment in a Survivor of Stage IV Neuroblastoma

Purpose: Neuroblastoma is a tumor of the sympathetic nervous system and adrenal medulla that most frequently affects the paravertebral area of the abdomen and the posterior mediastinum of children with a median age of 18 months at diagnosis. It accounts for 8% of pediatric cancers, yet it is responsible for 15% of deaths from pediatric cancer. Although great strides have been made in the treatment of this disease over the last several decades, children diagnosed with high-risk neuroblastoma still have an unfavorable 5-year survival rate of 40%. While extensive literature exists on the progression of neuroblastoma, not much can be found on the long-term effects of those who have survived high risk disease.

Methods: An 8-year-old female was diagnosed in 2005 with localized stage II neuroblastoma of her upper abdominal paraspinal region. The localized tumor was resected and she appeared to be cancer-free. However, she relapsed 3 months later with metastatic stage IV disease that had progressed to widespread bone marrow involvement. After approximately 3 years of undergoing multiple protocols of chemotherapy along with radiation, I-MIBG (metaiodobenzylguanidine) therapy and hematopoietic stem cell transplantation, this young girl was found to be tumor-free. She has been in continuous remission for 10 years but her survivorship has not been without great obstacles.

Results: While long term survival of stage IV neuroblastoma is a remarkable feat, the patient has continued to face obstacles resulting from late effects of treatment. She has had recurring bouts of thrombocytopenia, delayed-onset puberty with amenorrhea, primary ovarian failure and high frequency hearing loss, all of which resulted from her exposure to chemotherapeutic agents and radiation at a young age. She has faced these challenges with courage and a commitment to live as normally as possible; however, she must continue to be monitored closely for any long-term residual effects that could still manifest, in order to manage these effectively.

Conclusions: This is a unique case of a child diagnosed at an older than expected age with stage IV neuroblastoma who survived the high-risk cancer and has remained in remission for many years after her treatment. She has encountered and overcome many hardships during her remission. This case highlights the importance of studying the long-term effects of treatment that survivors of childhood cancer face as they enter adulthood.

Sponsor: N/A
IRB/IACUC#: CCHCS IRB

301 - Poster **Classification:** TCOM DO Student

Presenter: Landry Dorsett **Department:** UNT Health Pediatrics

Authors: Landry Dorsett, UNT Health Science Center; Tyler Hamby, Cook Children's Health Care System; Sandy Cope-Yokoyama MD, Cook Children's Medical Center; W. Paul Bowman MD, UNT Health Science Center

Ewing Sarcoma of the Pelvis in a Young Woman

Purpose: The goal of this project is to improve the management and clinical decision making for patients with Ewing sarcoma. It is also a goal to explore opportunities for earlier diagnoses, which could enhance treatment outcomes. Ewing sarcoma is a malignant tumor most often arising in the medullary cavity of bones and with greatest frequency in the pelvis, femur, and humerus. These patients present with pain at the site of the tumor, but there is often a delay in diagnosis that results in a more difficult course of treatment. The current 5-year survival rate is 75% with long-term cure rate of 50%. The outlook is worse for adolescent and young adult (AYA) patients, especially those with evidence of metastasis at diagnosis.

Methods: A retrospective analysis of this patient's medical history and treatment as it pertains to Ewing sarcoma was conducted.

Results: A healthy 18-year-old female presented to her family physician 10 months after the initial onset of hip pain with the chief complaint of constipation and general abdominal discomfort. The pain was progressively worsening and began to radiate down her anterior right thigh. It was exacerbated with exercise, walking, sitting, and caused difficulty sleeping. It was alleviated with bending forward and lying down. There were no reports of numbness, tingling, muscle weakness, or other symptoms in the right leg. On physical exam, her family physician palpated a mass in the right lower quadrant, which was confirmed by ultrasound to be approximately 12cm in diameter. A pelvic MRI confirmed a 9.2 x 13.9 x 12cm soft tissue mass of the right ileum. After 8 weeks of chemotherapy, the tumor showed a significant decrease in size, and she received proton-beam radiation therapy at 14 weeks. On six occasions, chemotherapy had to be delayed by one week to allow for platelet or white blood cell count recovery. At the conclusion of her chemotherapy regimen, the patient was considered to be cancer-free, in remission, and began off-therapy surveillance. This case is significant because it assesses the importance of a prompt diagnosis in the outcome of Ewing sarcoma patients, and the difficulties that can arise during a compressed interval treatment.

Conclusions: Despite the large period of time between onset of symptoms and diagnosis, the combination of chemotherapy and radiation achieved a remission. It will be important to follow this patient closely to monitor for risk of relapse and late effects of cancer treatment.

Sponsor: Pediatric Research Program & Summer Research Fellowship
IRB/IACUC#: CCHCS IRB

302 - Poster **Classification:** GSBS Student

Presenter: Akpedje Serena Dossou **Department:** Institute for Cardiovascular and Metabolic Disease
Authors: Akpedje Dossou, UNT Health Science Center; Nirupama Sabnis, UNT Health Science Center; Shradha Prabhulkar, Autotelic INC. Lipomedics; Andras Lacko, UNT Health Science Center

Investigating the Affinity Of Human Plasma Lipoproteins and Albumin to the Anti-Cancer Drug Valrubicin

Background: Reconstituted lipoproteins and albumin are promising targeted drug delivery agents. Valrubicin is a hydrophobic anti-cancer drug currently approved for the treatment of in situ BCG – resistant bladder carcinoma through intra-vesical instillation. An injectable formulation with the patients' own lipoproteins or albumin as carriers would not only make valrubicin an attractive therapy candidate for other types of cancer, but also limit immunological response and off-target effects including cardiotoxicity.

Purpose: This study aimed to assess the binding of valrubicin to human plasma lipoproteins and serum albumin (HSA) under different incubation conditions. We hypothesize valrubicin will preferentially associate with high density lipoprotein (HDL) due to its high hydrophobicity index.

Materials and Methods: A solution of valrubicin in dimethyl sulfoxide was incubated for up to 24 hours with either pooled whole human plasma or with individual plasma components at room temperature (RT) or 37 degrees Celsius. Plasma component fractions were separated by ultracentrifugation. A 45 mg/mL albumin solution was used for individual incubation. Absorbance at 490 nm was used to estimate valrubicin concentration in low density lipoprotein (LDL), HDL and HSA.

Results: Incubation for 2 hours at RT yielded the highest valrubicin concentration in plasma components. Overall, valrubicin association with plasma components moderately increased with the amount of valrubicin added prior to incubation. For instance, 0.185 mg and 1.121 mg of valrubicin was recovered with respectively 1 mg and 5 mg of valrubicin initially added to 1 mL of plasma. About 4%, 10% and 86% of the initial valrubicin added to whole plasma were respectively distributed in the LDL, HDL and the HSA –containing plasma fractions after ultracentrifugation. The incorporation of valrubicin in HDL increased- though not proportionally- with 10 fold concentration of HDL. However, prolonged incubation of valrubicin with 45mg/mL HSA resulted in the dissociation of valrubicin and HSA.

Conclusions: Our preliminary data suggests differential interaction of valrubicin with plasma components with preferential binding to HSA. The optimization of the HSA/ valrubicin complex will be required to develop an efficient drug transport formulation. HSA stabilizing agents such as sodium acetyltryptophanate and sodium caprylate could potentially facilitate and stabilize the binding of valrubicin to HSA.

Sponsor: SBIR subcontract (1 R43 CA203170-01)
IRB/IACUC#: N/A

303 - Poster **Classification:** TCOM DO Student

Presenter: Elizabeth Forner **Department:** Pediatrics

Authors: Elizabeth Forner, UNT Health Science Center; W Paul Bowman, UNT Health Science Center

The Use of Positron Emission Tomography-Computed Tomography in the Early Response Assessment of Nodular Sclerosing Hodgkin Lymphoma: A Case Series

Purpose: Positron Emission Tomography-Computed (PET-CT) is increasingly being incorporated into the management of pediatric lymphomas. Clinical trials are currently using "interim" PET/CT to assess early response and are seeking to establish whether its' predictive value can successfully be used to direct individual treatments with the purpose of improving outcomes and decreasing treatment-associated toxicities. This review presents three cases of pediatric Hodgkin's Lymphoma (HL) seen at Cook Children's Medical Center (CCMC) to demonstrate the role that PET/CT is currently playing in the management of high-risk HL patients.

Methods: A literature review was first performed in regards to the current protocol for PET-CT imaging in pediatric malignancies. It was found that the utility of PET-CT in this population is not yet a standard of care but there is support in the literature for its' use in risk-stratification and treatment modulation. A review of the cases of three pediatric HL patients at CCMC receiving PET-CT imaging during their initial treatment was performed. The clinical decisions made by practitioners were examined to determine whether the PET-CT imaging that was done in addition to standard CT imaging changed treatment decisions among these three patients. This was based on examining whether the radiologic reports from the PET-CT studies provided additional information about treatment response in comparison to the CT imaging that was performed. It was also examined whether this additional information that was provided by the PET-CT studies was used to guide clinical decisions as demonstrated by changes in treatment plans.

Results: In each of these three cases, PET-CT imaging provided the practitioner with additional information over the CT imaging alone. Patient 1 was found to have residual bulky disease on CT imaging. The PET-CT imaging provided the additional information that the lesions were not metabolically active. This demonstrated that the malignancy was responding well to the chemotherapy treatment. This patient was able to avoid radiation therapy due to the additional information that the PET-CT imaging provided. Patient 2 also showed residual bulky disease on CT imaging but a marked decrease in metabolic activity on PET-CT imaging similar to patient 1. This patient, however, had such extensive involvement at diagnosis that the protocol they are enrolled on required involved site radiation therapy (ISRT) regardless of PET-CT negativity. This case demonstrates a patient that may have been able to avoid radiation therapy if using PET-CT is the sole standard of treatment response assessment in the future. Patient 3 had one region that was found to still be metabolically active on PET-CT and was subjected to ISRT of this region specifically. Other previously involved regions avoided radiation therapy as they were determined by PET/CT to be responsive to chemotherapy.

Conclusions: PET-CT has become a valuable resource in evaluating the response to chemotherapy in this population. PET-CT played a pivotal role in the risk-stratification among these three patients and kept one of them completely off of radiation therapy and allowed the others to receive ISRT and allowed avoidance of full body radiation. It provides a promising means by which pediatric patients with high-risk HL can avoid unnecessary chemotherapy and radiation related toxicities.

Sponsor: N/A **IRB/IACUC#:** CCHCS IRB

304 - Poster **Classification:** TCOM DO Student
Presenter: Justin Haloot **Department:** Clinical Research
Authors: Justin Haloot, UNT Health Science Center; Mahdi Kaheri, UNT Health Science Center; Anish Ray, Cook Children's Medical Center

Hemophagocytic Lymphohistiocytosis Secondary to Malignancy and Chemotherapy in Pediatric Patients

Background: Hemophagocytic lymphohistiocytosis (HLH) is an uncommon yet potentially devastating systemic disease arising from uncontrolled activation of the immune system. While the primary form of this disease can be caused by genetic mutation(s), the secondary form maybe triggered by infection, hematologic, malignant and metabolic conditions. Here, we present 3 cases of HLH secondary to malignancy and chemotherapy in pediatric patients.

Purpose: The diagnosis of HLH remains a clinical challenge due to nonspecific symptoms such as fever, skin rash, cytopenias and splenomegaly found at presentation. Proper diagnosis is significantly more difficult among patients with acute leukemia who have received chemotherapy and present with fever and pancytopenia. The objective of this study is to describe three unique cases of secondary HLH, describe the specific treatment for this entity, and improve the awareness of this condition

Methods: Three patients were diagnosed with HLH at Cook Children's Medical Center (CCMC) between June 2006 and June 2016. They were treated per HLH-2004 guidelines. Medical records of these patients were reviewed at CCMC. Data collected included timeline of diagnosis of HLH in relation to primary diagnosis and treatment, laboratory values, pathology studies, outcome of HLH after treatment, and overall survival.

Conclusions: Two patients with acute myeloid leukemia (AML) and one with acute lymphoblastic leukemia (ALL) were diagnosed with HLH, having fulfilled the criteria as outlined in HLH 2004 protocol. They then received HLH specific treatment. One patient passed from refractory HLH, one from primary disease (i.e. AML) and one patient remains alive 22 months from her allogeneic bone marrow transplant. The diagnosis of HLH requires the presence of any of the five following criteria: fever, splenomegaly, bicytopenia, hypertriglyceridemia and/or hypofibrinogenemia, hemophagocytosis, low/absent NK cell activity, hyperferritinemia, and elevated soluble interleukin 2 receptor level. Due to its heterogeneous presentation, it remains imperative that treating clinicians remain cognizant about HLH so that prompt diagnosis may allow appropriate treatment. Two out of 3 patients in our study were in remission with regard to HLH, while 1 patient succumbed to refractory disease. We hope to improve awareness of HLH among pediatric oncologists that will lead to improved survival and better outcome for these patients.

Sponsor: N/A
IRB/IACUC#: CCHCS IRB 2016-048

305 - Poster **Classification:** GSBS Student

Presenter: Myrna Hurtado **Department:** Graduate School of Biomedical Sciences

Authors: Myrna Hurtado Ms, UNT Health Science Center; Umesh Sankpal Ms, UNT Health Science Center; Shahela Mahammad; Jaya Chhabra, Old Dominion University; Deondra T. Brown, Old Dominion University; Raj K. Gurung, Old Dominion University; Alvin A. Holder, Old Dominion University; Riyaz Basha, UNT Health Science Center

A Small Molecule Derivative as a Targeting Agent for Sp1 and Survivin Effectively Suppresses Pancreatic Cancer Cell Growth

Background: Pancreatic cancer has one of the most fatal malignancies due to its poor prognosis. It currently has a one-year survival rate of 20%. Current standard forms of treatment contain a high level of toxicity, thus preventing an increase in dosage or frequency. This issue poses the need for more effective, yet less toxic agents for treatment. Tolfenamic acid (TA) is most commonly used to treat migraines but has recently been demonstrated to contain anti-cancer properties. It is known to downregulate the Specificity Protein (Sp) transcription factor, Sp1. Sp1 regulates several genes involved in cell proliferation and apoptosis, including survivin, an inhibitor of apoptosis protein. Interestingly, a recent discovery proposed that a copper(II) complex with TA as a ligand can result in higher therapeutic response; however its efficacy was not tested in gastro-intestinal cancers.

Purpose: In this study, we assessed the therapeutic efficacy of a Cu(II)- containing complex of TA (Cu-TA) using human pancreatic cancer cell lines.

Methods: MIA PaCa-2 and Panc1 cells were treated with increasing concentrations of DMSO (vehicle), equimolar $CuCl_2$ (negative control), TA or Cu-TA and the cell viability was measured at 24 and 48 h post-treatment using CellTiter-Glo kit. CuTA was further tested for its effect on Sp1 and survivin expression by Western blot and quantitative PCR. The activation of apoptosis was determined by measuring the activity of effector caspases using the Caspase 3/7-Glo kit and the apoptotic cell population through flow cytometric analysis using Annexin-V staining. Cell cycle arrest was assessed by flow cytometry with propidium iodide staining.

Results: While both TA and Cu-TA inhibited pancreatic cancer cell growth in a dose/time-dependent manner. Cu-TA was highly effective in inhibiting Sp1 and survivin protein expression and showed similar trend for inducing apoptotic markers and causing cell cycle arrest in G2/M phase. The results of qPCR demonstrated that the expression of survivin mRNA was significantly lower following both Cu-TA and TA treatment; however, the mRNA expression of Sp1 remained unchanged. This indicates that TA and Cu-TA could be affecting Sp1 by a similar mechanism.

Conclusions: These results demonstrate that Cu-TA is more effective than TA and potentially useful for pancreatic cancer treatment after clinical testing. Studies to understand precise underlying mechanisms are currently under investigation.

Sponsor: N/A
IRB/IACUC#: N/A

306 - Poster **Classification:** Postdoctoral Fellow

Presenter: Piyush Kumar **Department:** Institute for Molecular Medicine

Authors: Piyush Kumar, UNT Health Science Center; Timothy Van Treuren, UNT Health Science Center; Amalendu Ranjan, UNT Health Science Center; Pankaj Chaudhary, UNT Health Science Center; Jamboor Vishwanatha, UNT Health Science Center

Cell Ghost Coated Polymeric Nanoformulation For Brain Metastasized Triple Negative Breast Cancer

Background: Nanoparticle-mediated targeted delivery has become the buzzword in cancer therapy due to its small size and ease in modulation. Cell ghost derived from cancer cells that mimic the cellular environment can be used for specific targeting of tumor in personalized therapy.

Purpose: The purpose of this study is to design drug delivery system for personalized medicine to check the brain metastasized Triple Negative Breast Cancer (TNBC). We speculate that cell ghost derived from the tumor of the cancer patient can also be used as a personalized treatment of metastatic cancer.

Methods: Cell ghost isolated from brain metastasized TNBC cells was coated on polymeric nanoparticles. Dynamic Light Scattering & Zeta Size analyzer (Malvern Instruments, USA) were used to determine the hydrodynamic size & surface charge of the cell ghost coated nanoparticles(CGNP) respectively. SDS-PAGE was used for comparative analysis of proteins in the cell ghost & CGNP. The Cell uptake of the dye-loaded CGNP was studied using the confocal microscope (Zeiss microscope USA).

Results: We have successfully formulated cell ghost coated polymeric nanoparticles (CGNP).The size & surface charge of the CGNP are in desirable range to cross the blood-brain barrier to target brain metastasized TNBC. The SDS-PAGE analysis confirmed that protein contents of cell ghost are stable in CGNP. Confocal microscopic image analysis showed that maximum cellular uptake of these nanoparticles by TNBC cell line.

Conclusions: In summary, we concluded that cell ghost isolated from TNBC cells could be used as targeting agents for brain metastatic TNBC. These nanoparticles have maximum cellular uptake and retain the protein contents of cell ghost on nanoformulation infers its possible role in generating personalized medicine for the brain metastasized TNBC treatment.

Sponsor: N/A
IRB/IACUC#: N/A

307 - Poster **Classification:** SPH Student

Presenter: Victoria Kwentua **Department:** UNT Health Obstetrics and Gynecology

Authors: Victoria Kwentua, UNT Health Science Center; Amy Raines-Milenkov, UNT Health Science Center; Eva Baker, UNT Health Science Center; Radhika Subedi, UNT Health Science Center; Emelda Thein, UNT Health Science Center; Iram Qureshi, UNT Health Science Center

Colorectal Cancer Knowledge and Screening Habits Among Refugee Populations in DFW

Purpose: Colorectal cancer (CRC) is the fourth most common cancer worldwide. Although resources are available to screen for and to treat CRC, refugees living in the United States report low levels of screening. Over the past several years, Texas has resettled the largest numbers of refugees, yet little research has investigated the need for colorectal cancer screening in refugee populations. This study aimed to assess local refugees' current knowledge of and experience with colon/rectal cancer and screening. This information is needed to guide effective CRC education and screening efforts among this underserved population.

Methods: Refugees, previously enrolled in a community-based refugee health program, the Building Bridges Initiative (BBI), were contacted by bilingual lay health educators to complete a 23-question phone interview on their familiarity with CRC. The survey was translated into Nepali and Karen by a professional translator, and included detailed descriptions of colon cancer and available screening methods. Descriptive statistics were compiled using statistical analysis software.

Results: Twenty-nine of the 43 eligible participants (ages 50-75) agreed to participate. 72% of participants were unaware of colon cancer, and 97% wanted more education on the subject. Familiarity with the screening process and physician recommendation were strong motivators to complete a CRC screening.

Conclusions: Local refugee populations are receptive to CRC screening. Programs such as BBI have the structure in place to provide culturally and linguistically appropriate education and tailored evidence-based interventions, which are necessary to reduce health disparities when it comes to CRC screening.

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308 - Poster **Classification:** SPH Student
Presenter: Furong Li **Department:** School of Public Health
Authors: Furong Li, UNT Health Science Center; Menghua Tao, UNT Health Science Center

Dietary Intake of Calcium, Magnesium and Risk of Breast Cancer

Objective: Magnesium (Mg) is the second most abundant intracellular cation in the body, and is essential for DNA synthesis and repair, and associated with DNA mutations leading to carcinogenesis. Calcium (Ca) plays an important role in various cellular activities including cell proliferation, differentiation, and apoptosis. Magnesium and calcium antagonizes each other in (re)absorption, cell cycle regulation, inflammation and many other physiologic activities. However, results on the relationships between dietary intake of magnesium and calcium remain mixed, and few studies have evaluated the interaction between calcium and magnesium intake on breast cancer incidence. We aim to test whether the associations of breast cancer risk with intakes of calcium and magnesium differ by the dietary Ca to Mg intake ratio.

Materials and Methods: The Swedish Women's Lifestyle and Health Cohort Study included 49,259 women in Sweden who were aged 30-50 years between 1991 to 1992. Complete follow-up for breast cancer incidence was performed until December, 2012 through linkage to national registries. Cox proportional hazard regression models were used to estimate hazard ratios (HR) and 95% confidence intervals (95% CI) for breast cancer risk.

Results: During follow-up, 1909 primary, incident breast cancer cases were diagnosed. After adjusting for known risk factors of breast cancer, intakes of energy, vitamin D, magnesium, higher dietary intake of calcium was associated with reduced breast cancer risk (HR: 0.98; 95%CI: 0.98-0.99 for highest versus lowest quartile; p trend = 0.01), and dietary intake of vitamin D was also associated with reduced breast cancer risk (HR: 0.46; 95%CI:0.25,0.86) for highest versus lowest quartile.

Conclusions: In this preliminary analysis, we found that dietary calcium and vitamin D intake may be protective factors of breast cancer for women.

Sponsor: N/A
IRB/IACUC#: 2016-117

309 - Poster **Classification:** TCOM DO Student

Presenter: Anshumaan Maharaj **Department:** Texas College of Osteopathic Medicine
Authors: Anshumaan Maharaj, UNT Health Science Center; Marlyn Panchoo, UNT Health Science Center; Nirupama Sabnis, UNT Health Science Center; Andras Lacko, UNT Health Science Center

The Therapeutic Role of rHDL Nanoparticles with Saquinavir in Fighting High Risk Neuroblastoma

Hypothesis: Our hypothesis is to determine how effective rHDL nanoparticles with saquinavir are in killing neuroblastoma cells. Specifically, we are looking to see how they effect specific cell lines that do express the SR-B1 receptor versus cell lines that do not express the SR-B1 receptor. We are also measuring the effect of rHDL with saquinavir versus free saquinavir in killing neuroblastoma cells.

Materials and Methods: The rHDL-saquinavir nanoparticles were prepared by cholate dialysis method, and their biochemical composition was determined using standard assay kits for the different components of the nanoparticle. The average size of the particles was measured using DeLsa Nano particle size analyzer. The cytotoxic effect of the rHDL-saquinavir combination versus free saquinavir was measured against a HRNB cell line, SMS-KCNR, using a CCK-8 kit.

Results: The most pertinent result came from the cytotoxicity assay, which showed that free saquinavir was more effective than rHDL with saquinavir in killing neuroblastoma cells from the SMS-KCNR cell line, which has low expression of SR-B1. This is contrary to the previous experiment (from last years data on this same project) which showed that rHDL wth saquinavir was more effective than free saquinavir in killing neuroblastoma cells from the IMR-5 and SJNKP cell lines, which have high expression of SR-B1.

Conclusions: From this project, we were able to conclude several things. First was that saquinavir was successfully incorporated into rHDL capsules to form a viable nanoparticle. The particle was also small enough to be incorporated into the cells. The biggest and main conclusion was that the SR-B1 receptor plays a key role in regulating uptake of the rHDL nanoparticles. Cells lines that had high expression of SR-B1 showed more uptake of the nanoparticles, and therefore more cell death. Cell lines that had low levels of expression of SR-B1 showed less uptake of the nanoparticles, and therefore less cell death. Free saquinavir showed more effective killing of cancer cells than encapsulated saquinavir when SR-B1 levels were low. Ergo, cancers that express high levels of SR-B1 can be targeted with encapsulated chemotherapeutic agents such as rHDL. Overall, rHDL nanoparticles are a novel therapeutic treatment strategy that can potentially be used in patients with high risk neuroblastoma as well as other forms of cancer.

Sponsor: N/A
IRB/IACUC#: N/A

310 - Poster **Classification:** TCOM DO Student

Presenter: Zahra Merchant **Department:** Pediatrics

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Educational Attainment and Special Education Use Among Long-Term Survivors of Childhood Cancer: Planning of a Childhood Cancer Survivor Study Project

Purpose: Childhood cancer survival rates have increased dramatically in recent years. Because of this, long-term complications are becoming more apparent. Survivors have previously been shown to have lower educational attainment and more special education use than their siblings. The proposed study will expand upon the extant literature by examining specific predictors of special education usage and educational attainment in cancer survivors. In particular, we will address the following aims: 1) Describe the usage of special education and educational attainment in a large cohort of survivors of childhood cancer diagnosed between 1970-1999, 2) Compare patterns of special education services and educational attainment by decade of diagnosis, 3) Determine predictors of use of special education and educational attainment, 4) Examine associations between use of special education services and educational attainment with chronic health conditions.

Methods: This is the first Cook Children’s initiated project to utilize the Childhood Cancer Survivor Study (CCSS), a retrospective longitudinal cohort funded by the National Cancer Institute (CA55727). Proposing and performing studies within the CCSS is a multi-step process. First, potential topics are discussed with a Working Group Chair who oversees the specific content. Second, an application of intent must be written with an identified CCSS mentor. Then, an initial analysis concept proposal must be written and approved by the Chair. Once approved, a full analysis concept proposal must be written and approved by a multidisciplinary publication committee. This proposal identifies the specific variables required to attain the outcomes of interest and maps out the analyses and tables to be used in the manuscript. Statisticians within the CCSS analyze the data and provide populated tables to the authors to interpret and write up the results and discussion.

Results/Conclusions: Because of the length of this process and CCSS’s policy of using their own statisticians, we do not yet have the results of our study. We have submitted a protocol to the CCSS and have worked with our mentor there. As we approach a final draft, our protocol will be reviewed by a larger publication committee. Then it will be sent to the statisticians for analysis. The proposed poster presentation will describe the CCSS population and study methods designed to capture meaningful data on survivors’ educational attainment and special education use.

Sponsor: Pediatric Research Program
IRB/IACUC#: CCHCS IRB

311 - Poster **Classification:** GSBS Student

Presenter: Marlyn Panchoo **Department:** Cardiovascular Research Institute

Authors: Marlyn Panchoo MS, UNT Health Science Center; Stefano Spolitu MS, University of Cagliari; Stefania Deligia MS, University of Cagliari; Barbara Batetta MD,PhD, University of Cagliari; Andras Lacko PhD, UNT Health Science Center

Cholesterol Metabolism in High Risk Neuroblastoma: Contributions by the SR-B1 Receptor and Cholesterol Ester Accumulation

Background: Cancer cells promote their survival by reprogramming metabolic pathways. Alterations in cholesterol metabolism have been observed as one of these mechanisms, including reduced levels of high-density lipoprotein (HDL) cholesterol in cancer patients. In high-risk neuroblastoma (HRNB), an extra cranial pediatric cancer, activation of genes associated with cholesterol synthesis has been reported. However, it is unclear whether modification in exogenous sources of cholesterol also occur in HRNB. An external source of cholesterol is from lipoproteins via the scavenger receptor class B type 1 (SR-B1) lipoprotein receptor that mediates the selective uptake of cholesteryl esters (CE) into the cell. In neuroblastoma high expression of SR-B1 correlates with poor prognosis.

Objective: Our goal was to examine whether the accumulation of cholesteryl ester occurs in HRNB cells and whether this process is correlated with SR-B1 expression.

Methods and Results: Human neuroblastoma cell lines expressing wild type p53; SH-SY-5Y, SMS-KCNR, and mutated p53; SK-N-BE (2), and BE (2) C were cultured. Western blot analysis confirmed the presence of the HDL receptor, SR-B1, and the multidrug resistant protein 1 (MDR1). Fluorescence staining of lipid droplets was performed using Nile Red. The neutral lipid content in SH-SY-5Y and SMS-KCNR, was higher at 24 hours than 72 hours suggesting that at 24 hours either increased accumulation or synthesis of neutral lipids occurred. To examine cholesterol esterification, cells were incubated with 14C-oleate. Cells were collected, lipids extracted with cold acetone and neutral lipids separated by thin layer chromatography. The results indicated notable reduction in cholesterol esterification in p53-mutated cells as compared to the wild type cells. However, triglyceride synthesis seems unaffected by p53 mutation when compared with the wild type.

Conclusions: We confirm that there is accumulation of cholesteryl esters and high expression of SR-B1 in HRNB. These findings present a more in depth understanding of molecular mechanisms that drive progression of HRNB and may provide unique molecular targets to combat HRNB and other cancers.

Future plans will include investigating cholesteryl ester accumulation and SR-B1 expression as a function of cell proliferation in HRNB. Additionally, human neuroblastoma tissue samples will be used to investigate the association between overexpression of SR-B1 and tumor aggressiveness.

Sponsor: TeamConnor Childhood Cancer Foundation
IRB/IACUC#: N/A

312 - Poster **Classification:** GSBS Student

Presenter: Shruti Patil **Department:** Institute for Cancer Research

Authors: Shruti Patil, UNT Health Science Center; Umesh Sankpal PhD, UNT Health Science Center; Areeba Hafeez, UNT Health Science Center; W. Paul Bowman MD, UNT Health Science Center; Riyaz Basha PhD, UNT Health Science Center

Combination of Vincristine and Tolfenamic Acid Induces Anti-proliferative Activity in Medulloblastoma Cells

Background: Medulloblastoma (MB) is the most common pediatric malignant brain tumor and usually originates in the cerebellum. These tumors have the propensity to disseminate throughout the central nervous system and are often difficult to treat. Chemotherapy is widely accepted as part of the multimodality treatment approach for MB. However, it is associated with debilitating toxicity and potential long term disabilities. Vincristine, a commonly used chemotherapeutic agent for MB treatment, is known to induce some toxic effects including peripheral neuropathy. Reducing the dose of the drug to minimize the toxic effect also reduces the cytotoxic efficacy of the drug.

Purpose: The aim of this study was to test a combination treatment involving vincristine and an anti-cancer non-steroidal anti-inflammatory drug, Tolfenamic acid (TA) against MB cell lines. Previously, we showed that TA inhibited MB cell proliferation and tumor growth in mice by targeting the transcription factor specificity protein-1 (Sp1) and an inhibitor of apoptosis protein, survivin. The overexpression of survivin is associated with aggressiveness and poor prognosis in several cancers.

Methods: DAOY and D283 cells were treated with vehicle (DMSO) or low dose of vincristine (DAOY: 2ng/ml; D283: 1ng/ml) or TA (10 μg/ml) or combination of vincristine + TA and the cell viability was measured at one and two days post-treatment using Cell-TiterGlo kit. Flow cytometry was employed to analyze apoptotic cells using Annexin-V staining and cell cycle phase distribution using propidium iodide staining. The activation of apoptotic pathways was further investigated by assessing the levels of effector caspases with Caspase 3/7-Glo kit and the expression of apoptotic markers [c-PARP, Bcl2, and survivin] by Western blot (WB) analysis. The expression of key proteins associated with cell cycle [Cyclin A, B, D CDK4/6 and p21] was also determined by WB analysis.

Results: When compared to individual agents, the combination of TA and vincristine increased MB cell growth inhibition which is accompanied by an induction of apoptotic markers and the modulation of proteins associated with cell cycle phase distribution.

Conclusions: These results suggest that vincristine and TA combination treatment is effective for inducing anti-proliferative response in MB cells. The experiments to evaluate the effect of this combination in animal model for MB are currently under study.

Sponsor: N/A
IRB/IACUC#: N/A

313 - Poster **Classification:** GSBS Student

Presenter: Sunil Shah **Department:** Biomedical Sciences

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Photophysical Characterization of Oligopeptide Linked FRET System in PVA Matrix and Buffer to Detect Levels of Matrix Metalloprotease-9

Purpose: Matrix metalloproteinases (MMP's) are a group of zinc dependent peptidases which can be classified based on their structural differences. So far, over 26 MMP's have been identified. Out of these, MMP-9 is of particular interest in many biomedical applications. MMP-9, also known as gelatinase B, plays an important role in degrading the basement membrane of the extracellular matrix (ECM). Levels of MMP-9 have been found to be upregulated in several types of cancer, including breast, bladder, colon, ovarian etc. and are generally associated with poor prognosis. The basement degradation activity of MMP-9 allows for tumor growth. Thus, the overall goal of this project is to develop applications for detecting MMP-9 enzyme levels. This would result in rapid, non-invasive detection, and possibly early treatment for several cancers.

Approach: We can use Forster resonance energy transfer (FRET) to come up with a custom peptide that is cleaved by MMP-9 enzyme, leading to easy detection and diagnosis. FRET is a well-known phenomenon being used today in studying molecular interactions. Briefly; FRET is the energy transfer between two fluorophores when they are within 1-10nms of each other. The fluorophore with emission at the shorter wavelength acts as the donor, and instead of emitting florescence, transfers its energy to an acceptor molecule, whose emission is generally at a longer wavelength. It is a very sensitive technique which can be used as a precise measurement and detection tool.

Materials and Methods: We were able to successfully demonstrate FRET with a custom peptide whose partial sequence was recognized and selectively cleaved by MMP-9 enzyme. The probe uses 5,6 TAMRA and HiLyte 647 as a donor and acceptor respectively. The target peptide sequence is Lys-Gly-Pro-Arg-Ser-Leu-Ser-Gly-Lys-NH_2, and was optimized by Kridel et al. The fluorophores were attached to the peptide at the Ser-Leu bond, labeled on the ε-NH2 groups of lysine with donor (5, 6 TAMRA) and acceptor (HiLyte647) dye. Peptide labelled with 5,6-TAMRA only was used as the donor control, and free HiLyte 647 was used as the control for acceptor. The probe and donor control were dissolved in 10% (w/w) poly-vinyl alcohol, and dried on glass slides. This produced films 200 microns in thickness. Furthermore, the probe was dissolved in buffer and upon addition of MMP-9 enzyme, showed a gradual decrease in energy transfer over time. These measurements were done by using a 1cmx1cm quartz cuvette and a square geometry set-up with 470nm as the excitation wavelength.

Results: Absorption spectra and other steady state measurements indicate successful energy transfer between donor and acceptor fluorophores which gradually reduces over time as it gets cleaved by MMP-9. This showed that the peptide is functional, and also being recognized and cleaved by MMP-9 enzyme.

Conclusions: It is possible to synthesize a functional FRET probe that is selectively cleaved by the enzyme MMP-9, which shows elevated levels in several cancers due to its role in basement degradation. We

successfully demonstrated using FRET as a precise technique to detect and measure MMP-9 enzyme activity.

Sponsor: NIH SBIR grant, 1R43CA193087-01 (W.M, R.F), and an NSF grant, CBET-1264608 (I.G).
IRB/IACUC#: N/A

314 - Poster **Classification:** GSBS Student
Presenter: Timothy Van Treuren **Department:** Institute for Cancer Research
Authors: Timothy Van Treuren, UNT Health Science Center; Priyanka Desai, UNT Health Science Center; Jamboor Vishwanatha, UNT Health Science Center

CRISPR Deletion of MIEN1 in Triple Negative Breast Cancer

Purpose/Objective: Triple negative breast cancer (TNBC), which accounts for 15-20% of all breast cancer diagnoses, is the most aggressive subtype of breast cancer. The propensity of TNBC to metastasize to vital organs, such as lung, brain and bone, early in the disease progression is its most devastating feature, which leads to the high mortality rates seen among women diagnosed with TNBC. Efforts to identify specific factors that are able to predict disease progression to aggressive TNBC have proved to be fruitless thus far. In addition, the standard treatments for TNBC are radiation therapy, systemic chemotherapy and/or resection surgery since there are currently no target-based therapies for TNBC. In an effort to address these knowledge gaps, the objective of this project is to knock-out (KO) the oncogene Migration and Invasion Enhancer 1 (MIEN1), implicated in TNBC disease progression, in MDA-MB-231 TNBC cells using CRISPR genome editing technology in order to assess MIEN1's ability to mediate migration and invasion.

Methods: Single-guide RNAs (sgRNAs) were designed to delete the C-terminal end of exon 2, along with exon 3 and 4 of the MIEN1 gene. Following transient transfection of CRISPR plasmids containing sgRNA/Cas9/GFP, MDA-MB-231 cells were FACS sorted into 96-well plates at a concentration of 1 cell/well. Colonies were then identified, genotyped and screened via western blot to confirm MIEN1 protein KO. Downstream signaling pathways were also analyzed via western blot. Various in vitro migration assays were performed to evaluate functional consequence of MIEN1 KO in TNBC cells.

Results: 22.2% of MDA-MB-231 single-cell colonies screened showed deletion of at least one MIEN1 allele. 10.3% of colonies screened showed complete KO of MIEN1 protein. In addition, western blots showed a reduction in downstream signaling through Akt/NF-kB as a result of MIEN1 KO. MIEN1 KO also resulted in reduced migratory phenotype in vitro.

Conclusions: Designed CRISPR sgRNAs effectively target the MIEN1 gene. MIEN1 KO in TNBC cells results in reduction of pro-metastasis signaling and cell migration.

Sponsor: N/A
IRB/IACUC#: 2009-001

315 - Poster **Classification:** Dual Degree student

Presenter: Andrew Gdowski **Department:** Institute for Cancer Research

Authors: Andrew Gdowski, UNT Health Science Center; Amalendu Ranjan, UNT Health Science Center; Victor Lin, UNT Health Science Center; Jana Lampe, UNT Health Science Center; Jamboor Vishwanatha, UNT Health Science Center; Andrew Gdowski, UNT Health Science Center

A Bioinformatics Approach to the Design and Engineering of Biomimetic Personalized Nanoparticle Therapy for Bone Metastatic Prostate Cancer

Purpose: Bone metastatic prostate cancer remains a challenge to treat clinically due to lack of therapies prolonging overall survival and off target side effects of current treatments. In this study, we employ a bioinformatics approach for target validation and design of biomimetic cancer-coated nanoparticles (CCNP) for treatment of bone metastatic prostate cancer. Our goal is to personalize this targeted therapy by utilizing a patient's own cancer cells to coat the nanoparticles. We hypothesize that this approach will be an effective strategy to deliver drugs to the site of metastasis.

Methods: A bone metastatic prostate cancer target was identified utilizing The Cancer Genome Atlas (TCGA) database from a study of 130 patients with metastatic prostate cancer who underwent next-generation sequencing of their tumors. We used this information and stimulated prostate cancer cells to increase expression of this targeted cell membrane protein. These membranes where purified and used to coat nanoparticles. Nanoparticles were characterized with TEM, DLS, and zeta potential. Membrane purification was validated with coommassie stain and western blot. Membrane orientation on nanoparticle surface was verified with an immuno-conjugation assay. Nanoparticle cancer cell uptake was quantified through immunofluorescence and flow cytometry. Cell viability was performed with MTT assay.

Results: Nanoparticles were successfully coated with stimulated cancer cell membranes. Nanoparticle size and zeta potential both increased after coating with membrane. After membrane purification, only markers for cell membranes were identified. Immuno-conjugation assay demonstrated that the cell membrane coating was correctly oriented on the nanoparticle surface. Immunofluorescence results showed when nanoparticles were coated with the cell membrane, there was increased nanoparticle uptake. This was verified by flow cytometry. Stimulated nanoparticles showed decreased cell viability in MTT assay.

Conclusions: We successfully engineered cancer coated nanoparticles and validated the manufacturing process. This novel approach to target identification and personalized coating of nanoparticles has tremendous potential as a strategy for treating bone metastasis in prostate cancer patients. Future experiments will study in vivo targeting of bone metastatic lesions with these biomimetic nanoparticles.

Sponsor: American Medical Association/ American Urological Association
IRB/IACUC#: 2009-001

Cardiovascular (Abstracts in the 400s)

400 - Poster **Classification:** GSBS Student
Presenter: Kirthikaa Balapattabi **Department:** Institute for Cardiovascular and Metabolic Disease
Authors: Kirthikaa Balapattabi, UNT Health Science Center; Joel Little, UNT Health Science Center; Martha Bachelor, UNT Health Science Center; J. Thomas Cunningham PhD, UNT Health Science Center

Role of Brain Derived Neurotrophic Factor in the Supraoptic Nucleus on Response to Salt Loading

Purpose: Previous studies have shown that Brain Derived Neurotrophic Factor (BDNF) contributes to ionic plasticity of vasopressin neurons from the supraoptic nucleus of the hypothalamus (SON) in response to 7 days of salt loading. This ionic plasticity is mediated by BDNF dependent phosphorylation of TrkB receptors and downregulation of KCC2, which alter chloride homeostasis resulting in impairment of baroreceptor inhibition of vasopressin release and an increase in mean arterial pressure that is partially vasopressin dependent. However, the specific source of BDNF is yet to be elucidated. In this study, we used adeno-associated viral vectors with shRNA to test the hypothesis that the salt loading produces BDNF release from the SON which in turn contributes to changes in chloride homeostasis and increased blood pressure.

Methods: Adult male Sprague Dawley rats (250-300 g b w) were anesthetized with isoflurane and bilaterally injected in the SON (300 nl) with either an AAV vector containing shRNA against BDNF or a control construct with an mCherry reporter. The vectors were injected at a titer of 1.0 X 10^{13} GC/ml (Vector Biolabs, Malvern, PA). Two weeks after the stereotaxic injections, some rats from each group were instrumented with radio telemetry transmitters using isoflurane anesthesia for recording mean arterial pressure and heart rate. Rats were then housed in commercial metabolism cages and given water or 2% NaCl to drink for 7 days. Volume of fluid intake, urine excretion, food intake, and body weight were measured during the study along with radio telemetry recording for heart rate, mean arterial pressure and activity. Brain regions were harvested for measuring gene expression and protein content at the end of the 7 days. Seven days of 2% salt loading increased TrKB phosphorylation in the SON of rats injected with the control vector.

Results: Virally mediated BDNF knockdown in the SON of salt loaded rats decreased TrkB phosphorylation. However, the increases in blood pressure produced by salt loading were not different between these two groups. Both salt loaded groups also had comparable decreases in body weight and increases in fluid intake.

Conclusions: The results suggest that, while locally produced BDNF contributes to TrKB phosphorylation in the SON during salt loading, it is not necessary for the increase in blood pressure.

Sponsor: Supported by grant # R01 HL119458
IRB/IACUC#: 2014/05-29-805

401 - Poster **Classification:** TCOM DO Student

Presenter: Kaethan Bysani **Department:** Cardiovascular Research Institute

Authors: Kaethan Bysani, UNT Health Science Center; Brandon Griffin, UNT Health Science Center; Daniel Cooley, UNT Health Science Center; Noah P. Jouett, UNT Health Science Center; Michael L. Smith, UNT Health Science Center

Effects of Acute Intermittent Hypoxia Training on Markers of Cardiac Autonomic Regulation

Background and Hypothesis: The intermittent episodes of hypoxia observed during apneic events of obstructive sleep apnea (OSA) increase the risk of cardiovascular disease, by altering sympathetic nervous activity (SNA); increased SNA outflow is postulated to be mediated by activation of angiotensin II receptors. Hypoxic apneic episodes were used to simulate short-term OSA with an intermittent hypoxic training (IHT) protocol, while assessing several indices of autonomic control with or without treatment with angiotensin receptor blockers (ARBs). Our hypotheses were: 1)Acute IHT training in healthy patient will increase indices of sympathetic control post-IHT compared to baseline, and 2)blockade of angiotensin II receptors with ARBs will attenuate the change in autonomic control associated with IHT.

Materials and Methods: Eight healthy subjects were studied on two days. On day 1, subjects were treated with placebo or Losartan and IHT. On Day 2, the study was repeated with the alternative treatment (ARB or placebo). The IHT protocol consisted of a 5 minute baseline, then 3 breaths of nitrogen followed by 20 second expiratory apneas with a 40 second recovery period between each apnea for a total of 20 apneas, and then followed by a 5 minute post-IHT period. Heart rate (ECG), beat-to-beat blood pressure (Finometer), and O_2 saturation (pulse oximeter) recorded continuously. The following autonomic indices were derived from these measures RRI, pNN50, and HF-RRI as indices of parasympathetic control, and LF-MAP, LF-SAP, and LF-RRI as indices of sympathetic control.

Results: The IHT conditioning produced significant reductions in parasympathetic control (evidenced by RRI, pNN50 and HF-RRI, $p<0.05$) and increases in sympathetic control (evidenced by LF-MAP, LF-SAP and LF-RRI, $p<0.05$). Treatment with the ARB did not significantly alter the responses of any of these variables (although the a levels for sympathetic indices were near significance ~0.1-0.15).

Conclusions: Acute IHT training in healthy individuals significantly enhanced the indices of sympathetic control, and reduced the indices of parasympathetic control. The ARB treatment did not significantly affect these measures although the sympathetic measures trended toward significance. Coupled with our prior finding that ARBs reduced the SNA post-IHT, these data suggest that further investigation is needed that includes a larger subject number and longer stimulus period similar to actual OSA.

Sponsor: N/A
IRB/IACUC#: 2016-007

402 - Poster **Classification:** Postdoctoral Fellow

Presenter: Sarika Chaudhari **Department:** Institute for Cardiovascular and Metabolic Disease
Authors: Sarika Chaudhari, UNT Health Science Center; Nicole Phillips, UNT Health Science Center; Marc Sprouse, UNT Health Science Center; Sara S. Jarvis, UT Southwestern Medical Center; Yoshiyuki Okada, UT Southwestern Medical Center; Jude Morton, University of Alberta; Sandra T. Davidge, University of Alberta; Qi Fu, UT Southwestern Medical Center; Styliani Goulopoulou, UNT Health Science Center

Circulating Cell-free Mitochondrial DNA In Normal Human Pregnancy and In Experimental Preeclampsia

Background: Mitochondrial DNA (mtDNA) is a damage-associated molecular pattern (DAMP) with potent immunogenic and inflammatory properties. Circulating cell-free mtDNA is increased in various inflammatory conditions associated with intense cell apoptotic processes. Pregnancy is characterized by systemic inflammation and placental apoptosis, which increase with advancing gestational age. The temporal changes of cell-free mtDNA during healthy pregnancy and in pregnancies with preeclampsia are unknown.

Hypothesis: Circulating cell free mtDNA increases with gestational age in pregnant women and these changes positively correlate with maternal cardiovascular responses and neonatal biometrics. In a rat model of preeclampsia, circulating mtDNA is increased compared to normotensive control rats.

Methods: Normal Human Pregnancy: Maternal blood samples were collected at early pregnancy (≤ 8 weeks of gestation), late pregnancy (32-36 weeks), and postpartum (6-10 weeks after delivery) in healthy, normotensive, pregnant women (n=21). Experimental Model of Preeclampsia: Reduced uterine perfusion pressure (RUPP) was surgically induced in pregnant rats on gestational day (GD) 14. Maternal blood samples were collected from RUPP rats (n=11) and control rats (Sham, n=11) on GD20. Absolute real-time PCR quantification of mtDNA was performed on whole genomic extracts from maternal human and rat sera using TaqMan® probes and chemistry.

Results: Normal Human Pregnancy: Circulating mtDNA in late pregnancy were greater compared to early pregnancy (0.02 ± 1.2 pg/µL vs. 0.04 ± 1.2 pg/µL, p=0.04) and remained elevated post-partum (0.03 ± 1.2 pg/µL). Both blood pressure and heart rate increased from early to late pregnancy and decreased postpartum (pExperimental Model of Preeclampsia: RUPP rats had increased circulating mtDNA as compared to the sham group (0.30 ± 0.04 copy number/µL vs. 0.18 ± 0.04 copy number/µL, p=0.03).

Conclusions: In normal pregnant women, circulating mtDNA change with advancing gestational age and may reflect rates of placental cell apoptosis. In a rat model of preeclampsia associated with placental ischemia, circulating cell free mtDNA is elevated in late pregnancy. The temporal changes in mtDNA in preeclampsia and their functional role in normal and preeclamptic pregnancies need to be further evaluated.

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IRB/IACUC#: 2014-124 2016/17-03-T04

403 - Poster **Classification:** TCOM DO Student

Presenter: Daniel Cooley **Department:** Cardiovascular Research Institute
Authors: Daniel Cooley, UNT Health Science Center; Kaethan Bysani, UNT Health Science Center; Brandon Griffin, UNT Health Science Center; Noah Jouett, UNT Health Science Center; Michael L. Smith, UNT Health Science Center

Cerebral Blood Flow Changes During Acute Apneic Episodes Simulating Obstructive Sleep Apnea

Background: Obstructive sleep apnea (OSA) has not only been linked to hypertension and increased cardiovascular risk, but it can also result in mental status changes such as memory impairment. Under normal conditions, autoregulation in the cerebral vasculature maintains a constant flow rate to the brain. As such, the observed changes in the mental status may result from altered cerebral blood flow in OSA patients. By simulating apneic conditions using Intermittent Hypoxic Training (IHT), we can approximate the effect of OSA on cerebral blood flow using a Transcranial Doppler (TCD) to monitor middle cerebral artery (MCA) flow velocity. Using these techniques, we tested the hypothesis that IHT would cause alterations in cerebral blood flow in healthy individuals.

Methods: Nine healthy subjects were recruited for the study. Subjects were between 18-40 years of age and free of any pre-existing OSA or Cardiovascular disease. The IHT protocol consisted of a series of hypoxic apneas in which subjects inhaled 2-3 breaths of nitrogen, followed by a 20-second apnea and 40 seconds of room air breathing recovery every minute for 20 minutes. TCD was used to record MCA velocity throughout the study and, additionally, ECG and cardiopulmonary perimeters were also recorded.

Results: The MCA velocity during 5 minutes baseline and 5 minutes post-IHT was compared. The measured TCD flow velocity was not statistically different ($p>0.05$) between baseline and post-IHT including the following TCD variables: systolic, diastolic, mean, pulsatility, MAP coherence, MAP phase, MAP transfer and vascular resistance (all $p>0.05$).

Conclusions: Cerebral blood flow measures were not significantly altered following IHT in these healthy individuals. The data demonstrates that a 20 minute period of simulated sleep apnea does not affect steady-state cerebral blood flow. Thus, it is likely that cerebral autoregulation is sufficient to maintain normal blood flow in healthy subjects and is not affected by this period of IHT. Further studies may need to examine chronic OSA subjects to discern whether altered cerebral blood flow plays a pathophysiologic role in the disease.

Sponsor: N/A
IRB/IACUC#: 2016-007

404 - Poster **Classification:** TCOM DO Student

Presenter: Jace Coon **Department:** Institute for Cardiovascular and Metabolic Disease

Authors: Jace Coon, UNT Health Science Center; Justin Sprick, UNT Health Science Center; Steven Romero, UNT Health Science Center; Caroline Rickards, UNT Health Science Center

Assessment of Arterial Occlusive Pressures for Blood Flow Restriction Exercise

Introduction: Blood flow restriction exercise is a training technique that involves restricting blood flow to an active limb (i.e. arm or leg) during exercise, and can stimulate muscle hypertrophy. Application of this technique is limited, however, as the optimal occlusive pressure required for physiological benefit has not yet been clearly identified. A cuff pressure of 220 mmHg around the upper thighs has been used in a blood flow restriction exercise study in this laboratory, but the degree of arterial occlusion elicited by this pressure has not been investigated. The aims of this investigation were to 1) quantify the degree of blood flow restriction induced by this cuff pressure (220 mmHg); and, 2) assess the cuff pressure required for complete occlusion of arterial blood flow. We hypothesized that 220 mmHg cuff pressure would not result in complete arterial occlusion of the superficial femoral artery in all subjects.

Methods: 3 human subjects (1M/2F) underwent a protocol of progressively increasing cuff pressures applied to both upper thighs from 220 mmHg to 300 mmHg, in 10 mmHg increments every 60 s. Blood velocity and diameter of the superficial femoral artery was measured using duplex ultrasound during each stage. Superficial femoral artery blood flow was calculated as [time averaged mean velocity x $[(\text{radius})^2 \times \pi]$]. Muscle oxygenation ($SmO_2$) of the vastus lateralis was measured using near infrared spectroscopy, and mean arterial pressure (MAP) and stroke volume (SV) were calculated via finger photoplethysmography.

Results: 220 mmHg cuff pressure reduced superficial femoral artery blood flow by 30.9 ± 14.8%, accompanied by a 4.2 ± 2.3% reduction in SV, a 0.2 ± 0.3% reduction in SmO_2, and a 2.0 ± 1.7 mmHg increase in MAP. Complete occlusion of the superficial femoral artery was not achieved, even at a maximal cuff pressure of 300 mmHg; superficial femoral artery blood flow was reduced by 20.1 ± 7.6%, SV decreased by 21.1 ± 5.8%, SmO_2 decreased by 22.3 ± 6.3%, and MAP increased by 3.4 ± 4.2 mmHg.

Conclusions: In support of our hypothesis, 220 mmHg cuff pressure did not result in complete occlusion of the superficial femoral artery. This stimulus was sufficient to reduce venous return, however, as evidenced by the reduction in stroke volume. These findings could be relevant to future blood flow restriction exercise studies, as they provide insight into the degree of arterial occlusion achieved at rest by a standard cuff pressure of 220 mmHg.

Sponsor: PDRT program, which is an NIH training grant
IRB/IACUC#: 2016-129

405 - Poster **Classification:** TCOM DO Student

Presenter: Spencer C. Cushen **Department:** Institute for Cardiovascular and Metabolic Disease
Authors: Spencer Cushen, UNT Health Science Center; Oluwatobiloba Osikoya, UNT Health Science Center; Styliani Goulopoulou PhD, UNT Health Science Center

L-sulforaphane Decreased Contractile Response in Mesenteric Arteries in A Rat Model of Gestational Hypertension

Background: Maternal hypertension is a state of inflammation characterized by oxidative stress. Exposure of pregnant rats to the Toll-like Receptor 9 activator, ODN2395, induces hypertension and upregulates vascular oxidative stress. The transcription factor, Nuclear Factor Erythroid 2 Like 2 (Nrf2), is a regulator of antioxidant response, is overexpressed in placentas from patients with preeclampsia. However, the role of Nrf2 in maternal vascular dysfunction is unknown.

Hypothesis: L-sulforaphane, an Nrf2 activator, will have anti-contractile effects on arteries from pregnant rats treated with CpG oligonucleotides (a model of gestational hypertension).

Methods: Pregnant Sprague-Dawley rats were treated with synthetic unmethylated CpG oligonucleotides (ODN2395, 100µg/intraperitoneal injection) or saline (Control) on gestational day 14, 16, and 18 (term=21-22 days). Blood pressure was measured before pregnancy and on gestational day 19 using the tail cuff method. The contractile responses of mesenteric resistance arteries to a thromboxane A_2 (TxA_2) mimetic, U46619, in the presence or absence of Nrf2 activator, L-sulforaphane (L-S, 40 µM), were assessed by wire myography on gestational day 21.

Results: Rats treated with ODN2395 had greater systolic blood pressure on gestational day 19 compared to control rats (Control, n=9: 100±4 mmHg vs. ODN2395, n=7: 119±4 mmHg, p=0.007). Three-hour but not one-hour incubation with L-sulforaphane reduced the contractile response to U46619 in mesenteric arteries from both ODN2395 and control rats (Peak contraction as %Max KCl (120mM), Control Veh: 120.5%±4.85; Control L-S: 39.1%±7.16; ODN2395 Veh: 111.1%±4.19; ODN2395 L-S: 42.6%±2.68).

Conclusions: Pregnancy is a state of oxidative stress and this may explain the anti-contractile effects of L-sulforaphane in arteries from normal, healthy rats. In preeclampsia, levels of oxidative stress are greater compared to normotensive pregnancies and thus, systemic treatment with L-sulforaphane or other Nrf2 activators may improve poor cardiovascular outcomes in pregnancies with preeclampsia.

Sponsor: University of North Texas Health Science Center (ICMD & TCOM Summer Fellowships, TCOM Honors Practicum); American Heart Association
IRB/IACUC#: 2013/14-40-A05

406 - Poster **Classification:** Staff (Not For Competition)

Presenter: Brad Dimos **Department:** Institute for Cardiovascular and Metabolic Disease

Authors: Bradford Dimos, UNT Health Science Center; Deborah Osikoya, UNT Health Science Center; Paresh Jaini, UNT Health Science Center; An Nguyen, UNT Health Science Center; Melissa Valdes, UNT Health Science Center; Styliani Goulopoulou, UNT Health Science Center

Exposure to Synthetic CpG DNA During Pregnancy Increases Expression and Activity of Cyclooxygenase in Maternal Arteries

Objective: Preeclampsia is a pregnancy-associated disorder that is characterized by elevated maternal blood pressure, end organ damage, and/or proteinuria. This pregnancy syndrome affects 2-8% of pregnancies worldwide and has no treatment other than fetal delivery. The mechanisms behind the development of this condition remain unknown and is one of the barriers preventing the development of effective treatment. One of the suggested etiologies behind preeclampsia is activation of the innate immune system. We have previously determined that maternal exposure to CpG DNA (a ligand of Toll-like Receptor-9, TLR-9) causes maternal hypertension and excess vasoconstriction. In cancer cells, CpG DNA/TLR-9 activation leads to upregulation of cyclooxygenase (COX), which is the rate-limiting step in the conversion of arachidonic acid to prostaglandins and thromboxanes. It is unknown whether treatment with CpG DNA during pregnancy affects COX in maternal and fetal tissues.

Hypothesis: Treatment of pregnant rats with CpG DNA induces maternal hypertension and increases COX function in maternal and fetal tissues.

Methods: Pregnant Sprague-Dawley rats were treated with ODN 2395 (synthetic CpG DNA, 100µg/rat/ i.p. injection) and saline (control group) on gestational days (GD): 14, 16, 18 (term: 21-22 days). Tail cuff blood pressure was measured on GD19. On GD20, rats were euthanatized and maternal liver and arteries as well as fetal tissues were frozen for western blot analysis. Thromboxane B_2 (TxB_2) was measured in serum and media from maternal arteries by ELISA.

Results: ODN 2395 increased systolic BP (Control: 100±4 mmHg vs. ODN2395 119±4 mmHg, p=0.006). Serum TxB_2 was greater in the ODN 2395 group compared to control rats (Control: 65.2±8.9 ng/mL vs. ODN2395: 123.6±19.7 ng/mL, p=0.03). ODN2395 also increased release of TxB_2 from mesenteric (Control: 28.2±4.3 pg/mg tissue vs ODN 54.5±6.2 pg/mg tissue, p=0.008) but not from uterine arteries (p>0.05). Western Blot analysis revealed greater expression of COX-2 in mesenteric (p=0.002) and uterine arteries (p=0.006) in ODN2395-treated animals. ODN2395 increased COX-1 expression in mesenteric arteries (p=0.006) and showed a moderate effect on uterine arteries (p=0.07). No differences were observed between treatment groups for COX-1 and COX-2 in maternal (p>0.07) and fetal liver (p>0.20).

Conclusions: Exposure to CpG DNA during pregnancy induced maternal hypertension and augmented function of COX in maternal arteries.

Sponsor: American Heart Association
IRB/IACUC#: 2013/14-40-A05

407 - Poster **Classification:** School of Health Professions Student
Presenter: Victoria Florez **Department:** Physician Assistant Studies
Authors: Victoria Florez, UNT Health Science Center; Jessica Cox, UNT Health Science Center; Kaylee Davis, UNT Health Science Center; Cristen D. Hamilton, UNT Health Science Center; Jessica L. Hartos, UNT Health Science Center

Is Kidney Disease Related to Heart Disease in Elderly Males?

Introduction: Kidney disease and heart disease are two common chronic diseases and although a relationship between the two has been found, there is conflicting results regarding which acts as a predisposing risk factor for the other. The purpose of this study was to assess the relationship between kidney disease and heart disease in males aged 65 years old and older, and to determine which acts as the predominating risk factor in the relationship.

Methods: Data from the 2014 Behavioral Risk Factor Surveillance System (BRFSS) for Arizona, Nevada, Texas, and Oklahoma for males aged 65 years and older was used in this cross-sectional analysis. Multiple logistic regression analysis was used to assess the relationship between kidney disease and heart disease while controlling for diabetes, weight status, exercise, educational level, tobacco use, and ethnicity/race.

Results: For males aged 65 years and older, about one-fifth reported that they had ever been diagnosed with angina or coronary heart disease (16-21%) and about one-tenth of participants reported ever being diagnosed with kidney disease (not stones, UTI, or incontinence) (5-9%). After controlling for comorbidities, behavioral factors, and socioeconomic status, kidney disease and heart disease were found to be related (moderate effect sizes) in Nevada, Arizona, and Texas, and both were found to be related to diabetes (moderate to large effect sizes) in Nevada, Arizona, and Oklahoma.

Conclusions: Overall, kidney disease and heart disease were found to be related to one another and to diabetes in population-based samples of males aged 65 years and older; however, this study is unable to establish the direction of influence. Although kidney disease and heart disease would not be very prevalent in men aged 65 years and older with 5-9% and 16-21% in a primary care setting, and diabetes would be somewhat more prevalent with 23-26%, it is recommended that primary care practitioners follow the progression of patients with kidney disease, heart disease, and diabetes as screening for the others may be indicated in some patients depending on their severity and prognosis.

Sponsor: N/A
IRB/IACUC#: 2016-074

408 - Poster **Classification:** School of Health Professions Student

Presenter: Samantha B. Foley, PA-S **Department:** Physician Assistant Studies

Authors: Samantha Foley, UNT Health Science Center; Kelsey Carpenter, UNT Health Science Center; Paige Schwab, UNT Health Science Center; Camille A. Schaffner, UNT Health Science Center; Jessica L. Hartos, UNT Health Science Center

Is Depression a Risk Factor for Cardiovascular Disease in Middle-Aged Women?

Introduction: Cardiovascular disease (CVD) and depression are prevalent morbidities found in middle aged adults; however, the association between depression and cardiovascular disease remains largely understudied in middle-aged females. The purpose of this study was to assess whether depression is a risk factor for cardiovascular disease in middle-aged women 40-65 years old.

Methods: This cross-sectional analysis used 2014 data from the Behavioral Risk Factor Surveillance System (BRFSS) for females ages 40-65 in Alabama (N=2621), Louisiana (N=2025), Mississippi (N=1251), and Tennessee (N=1528). Multiple logistic regression analysis was used to assess the relationship between depression and cardiovascular disease, after adjusting for age, ethnicity/race, exercise, diabetes, alcohol use, tobacco use, and marital status.

Results: Few participants in the target population reported they were ever diagnosed with angina or coronary heart disease (5-6%) or ever diagnosed with any form of depression or dysthymia (26-31%). After controlling for demographic, psychosocial, and behavioral factors depression was significantly associated with an increased risk of cardiovascular disease in two of fours states. In addition, diabetes and age (55-65) were related to CVD in two of four states.

Conclusions: These findings suggest depression may increase the risk for CVD in middle-aged women in the general population. This cross-sectional study could not determine the direction of the relationship between depression and cardiovascular disease. Although CVD and depression are not prevalent in the general population, it is still recommended that practitioners screen, educate, and provide referral services as necessary.

Sponsor: N/A
IRB/IACUC#: 2016-074

409 - Poster **Classification:** Pharmacy Student

Presenter: Hiral Gandhi **Department:** Pharmacy

Authors: Hiral Gandhi, UNT Health Science Center; Abigail Hulsizer, UNT Health Science Center; Caitlin Gibson, Pharm.D, UNT Health Science Center

Comparison of Time to Tissue Plasminogen Activator in Patients Receiving In-Hospital Vs. Emergency Medical Services Lab Draws

Purpose: Tissue plasminogen activator (tPA) is beneficial when given within 4.5 hours of acute ischemic stroke onset, giving patients an increased likelihood to recover without any significant disability within a 3-month time period. Delays in diagnosis and laboratory data can place patients outside the tPA window. In an attempt to shorten time to tPA administration, some emergency medical services (EMS) companies have begun drawing blood for labs in the ambulance. The aim of this study is to determine if laboratory draws inside the ambulance shorten the time to tPA administration.

Methods: This study is a retrospective chart review of patients admitted to a 348-bed community hospital for acute ischemic stroke who received tPA. Patients were included if they were greater than 18 years of age who have arrived at the hospital via EMS who have had an ischemic stroke with a clearly defined time of onset, a deficit measurable on the NIHSS, and a baseline computed tomographic (CT) scan of the brain that showed no evidence intracranial hemorrhage. Patients were excluded if they arrived with rapidly improving symptoms signaling a TIA, if they did not have a definitive ischemic stroke diagnosis, and/or if they had the stoke on site and did not have the opportunity to have an EMS vehicle transport. The primary outcome was to determine if receiving labs in the EMS significantly reduced door to needle time compared to receiving labs in the Emergency Department (ED). The secondary outcome was to determine if there were better health outcomes, as determined by discharge NIH scores, in patients receiving tPA within a shorter amount of time due to getting labs in an ambulance. Safety outcomes were adverse events related to tPA, such as angioedema, intracranial hemorrhage and anaphylaxis within 24 hours. Descriptive statistics were utilized.

Results: Twenty-nine patients met inclusion criteria with one patient making two visits in the past year. The mean age and door to needle time (DTN) were 58.8 years-old and 77.5 minutes respectively. Hypertension, diabetes and smoking history were present in 78.1 percent, 43.7 percent, and 30 percent of patients, respectively. Of those who came by ambulance only 30 percent (n=11) had labs drawn in route to the hospital. The average DTN for those who had labs drawn in the EMS was 77.7 minutes. From the remaining patients, the average DTN time from the who had labs drawn at the hospital was 86.3 minutes. During the study, two patients expired from complications of tPA. One patient suffered a repeat stroke within the year.

Conclusions: EMS lab draw in patients suspected of acute ischemic stroke was associated with a 8.6-minute decrease in door to needle time compared to patients who had labs drawn at the hospital. Clinical significance is likely negligible.

Sponsor: N/A
IRB/IACUC#: 2016-098

410 - Poster **Classification:** TCOM DO Student

Presenter: Jason Gnasigamany **Department:** Surgery

Authors: Jason Gnasigamany, UNT Health Science Center; Albert Olivencia-Yurvati, UNT Health Science Center

The Stability of Armature Wire to Maintain the Y-Shaped Chest Tube Curvature at Physiologic Temperature

Background: The Y-shaped chest tube with split ends divides within the thoracic cavity, permitting both mediastinal and pleural placement with a single exit port. To maintain the curvature of the pleural tube, we have employed the Jack Richeson 1/16" armature wire. This study tests the migration of the pleural tube due to the expansion of the armature wire at physiologic temperature. The purpose of this study is to provide insight into determining the appropriate biomaterial for the novel Y-shaped chest tube.

Methods: This study contains separate experiments for five luminal sizes (20, 24, 28, 32, and 36Fr) of silicone catheter tubes, each wrapped with armature wire. A heated water bath was created with a Cole Parmer Immersion Circulator heater. Tubes were placed in the bath for 24 hours to test the angle changes at the proximal split point and the distal pleural end. Two sets of data were collected for each size, physiologic temperature (n=5) and room temperature (n=5).

Results: The tube displacement was measured at proximal and distal sites. Values are compared by ANOVA. Proximal measurements: There is no significant difference in displacement between room and physiologic temperatures (P=0.095). Using the Newman-Keuls method of pairwise multiple comparison, the difference in mean values among the different luminal diameters were noted (within 23.33°C: 32Fr vs. 24 Fr P=0.004; within 37°C: 32Fr vs. 20Fr P=0.012, 32Fr vs. 24Fr P=0.018, 32Fr vs. 28Fr P=0.015, 32Fr vs. 36Fr P=0.028; within both temperatures: 32Fr vs. 20Fr P=0.007, 32Fr vs. 24Fr PDistal measurements: There is no significant difference in displacement between room and physiologic temperatures (P=0.423). There is no significant difference in displacement among the different tube diameters (P=0.073). The effect of different levels of temperature does not depend on which tube luminal diameter is present (P=0.593).

Conclusions: These data suggest that change in temperature will not significantly affect the wire to cause tube migration. However, it is noticed that the tube diameter has a significant effect on its migration. Thus, further studies need to be completed to determine the extent of this effect.

Sponsor: N/A
IRB/IACUC#: N/A

411 - Poster **Classification:** TCOM DO Student

Presenter: Brandon Griffin **Department:** Cardiovascular Research Institute

Authors: Brandon Griffin, UNT Health Science Center; Noah Jouett, UNT Health Science Center; Scott Winter MD, JPS Health Network; Karla Lopez MD, JPS Health Network; Jaskirit Gill MD, JPS Health Network; Kathryn Adams MD, JPS Health Network; Brian Grimwood DO, JPS Health Network; Susan Franks PhD, UNT Health Science Center; Mandy Burton MPH, JPS Health Network; Michael L. Smith PhD, UNT Health Science Center

Exaggerated Pressor Response to Voluntary Apneas in Patients with a History of Anxiety

Background and Hypothesis: Patients with anxiety disorders tend to have an increased risk of cardiovascular complications including heart failure,cardiovascular mortality, and coronary heart disease. Knowing that an increase in sympathetic activity is detrimental to cardiovascular health this study was conducted to test the hypothesis that anxiety patients would demonstrate increased sympathetic responses to a voluntary apnea, a recognized physiologic stress that simulates the typical stress response.

Methods: Previously, our laboratory has shown that systolic arterial pressure (SAP) changes are a reliable index of sympathetic responses during voluntary apneas. Therefore, we studied the SAP responses to voluntary apneas in 10 patients diagnosed with generalized anxiety disorder and 37 healthy control subjects. Room air voluntary apneas were performed by each subject six times while SAP (Finometer and auscultatory) and heart rate (ECG) responses were measured continuously during each apneic episode. Peak changes in arterial pressure from baseline to end of apnea were quantified.

Results: The pressor responses to voluntary apneas in the anxiety patients exhibited a marked increase in SAP (16.962 ± 8.002, $P<0.001$), whereas the control group did not show a significant change in SAP (1.730 ± 7.441, $P=0.166$). Furthermore, when compared to the control subjects, the increase in SAP of the anxiety subjects was also significantly elevated ($P<0.01$).

Conclusions: These data demonstrate that anxiety subjects have enhanced sympathetic neural activity responses (as measured by the pressor response) to a mild physiologic stressor that does not provoke a response in non-anxious individuals. These data may explain, in part, the increased cardiovascular complications seen is this population, and suggest that the pressor response to apnea may be a simple tool for assessing altered physiologic function and cardiovascular risk in these patient populations.

Sponsor: N/A
IRB/IACUC#: 2014-080

412 - Poster **Classification:** Pharmacy Student

Presenter: Brenton Hall **Department:** Pharmacotherapy

Authors: Brenton Hall, UNT Health Science Center; Caitlin Gibson, UNT Health Science Center; Meredith Howard PharmD BCPS, UNT Health Science Center

Effectiveness and Safety of Indomethacin for Decreasing Chest Tube Duration After Coronary Artery Bypass Graft Surgery

Purpose: Early removal of chest tubes in coronary artery bypass graft (CABG) patients is a factor that positively affects length of hospital stay. Indomethacin is sometimes used in one community hospital to reduce chest tube output via reduction in inflammation in an attempt to shorten chest tube duration. Nonsteroidal anti-inflammatory drugs, including indomethacin, are contraindicated in the setting of CABG due to a boxed warning regarding increased risk of cardiovascular thrombotic events. The aim of this study was to determine if the use of indomethacin in CABG patients is safe and effective in shortening the duration of chest tube placement.

Methods: This was a retrospective chart review of patients in a 348 bed community hospital receiving indomethacin therapy after CABG surgery. The records of all adult patients receiving CABG surgery between 2010 and 2015 were systematically screened for receipt of at least one dose of indomethacin while chest tubes remained inserted. Charts with admit diagnoses of cardiac arrest or stroke were omitted from review. Identified subjects were individually matched based on demographics, medical history, and concomitant cardiac surgeries. Data collected included patient comorbidities, daily chest tube output, duration of chest tube placement, and concomitant medications. The primary outcome measure was change in time from first dose of indomethacin until removal of chest tubes compared with duration of insertion of chest tubes in control patients. The secondary outcome measure was total duration of chest tube insertion. Safety endpoints included occurrence of thrombotic events, TIMI bleeding in the setting of CABG, or death. Descriptive statistics were utilized. This study was approved by the institutional review board.

Results: Sixteen patients received indomethacin and were eligible for inclusion. They were matched 1:1 to 16 patients not receiving indomethacin. Two of the patients in the indomethacin group received heart valve replacement at time of CABG and were able to be matched only on sex and type of valve replaced. The median age was 55 years in the indomethacin group and 56 years in the control group. Twenty-four subjects were male. Indomethacin was associated with a shorter duration of chest tube insertion when comparing time from first dose of indomethacin to chest tube discontinuation with duration of insertion in control. The median decrease in duration of chest tube insertion in the indomethacin group was 14.5 hours. The median total duration of chest tube insertion in indomethacin and control patients was 214.3 and 91.2 hours, respectively. No patients experienced thrombotic events, bleeding, or death during admission.

Conclusions: Indomethacin decreased chest tube insertion times, however the clinical impact of this reduction is uncertain. Although it has shown to be safe in this cohort study, more studies are needed to determine if indomethacin has a place in the setting of CABG surgery.

Sponsor: N/A
IRB/IACUC#: 2015-157

413 - Poster **Classification:** TCOM DO Student

Presenter: Hillary Jackson **Department:** Cardiovascular Research Institute
Authors: Hillary Jackson MS, UNT Health Science Center; Ruth Osho MS, UNT Health Science Center; Noah Jouett, UNT Health Science Center; Michael L. Smith PhD, UNT Health Science Center

Pressor Responses to Voluntary Breathhold is Exaggerated in African Americans with Sleep Apnea and with Hypertension

Introduction: Previously, we demonstrated that the chemo-reflex control of sympathetic nerve activity (SNA) is exaggerated in patients with obstructive sleep apnea (OSA), in that the SNA and systolic arterial pressure (SAP) response to a voluntary breath hold was greater than in individuals without OSA. This previous study did not distinguish ethnic differences, nor was the response in hypertensive patients assessed systematically. In this pilot study, we hypothesized that the SAP response to apnea (as an index of the chemo-reflex sensitivity), is exaggerated in African-Americans (AA) with OSA compared to healthy AA individuals, and that the presence of hypertension exacerbated this response.

Methods: Standard auscultatory blood pressure was measured in triplicate during quiet rest and immediately following a 20 sec voluntary end-expiratory breath hold (apnea) in the following groups of AA volunteers: 18 normotensive (7 with OSA) and 28 hypertensive (16 with OSA).

Results: Post-apnea change in SAP increased significantly more in patients with OSA than those without OSA, $p<0.001$. In addition, patients with hypertension had SAP responses to apnea that were greater than normotensive subjects, $p<0.05$.

Conclusions: These data demonstrate that measurement of the SAP response to a voluntary breath hold can distinguish AA subjects with OSA from those without OSA, and that the presence of hypertension may exaggerate these responses.

Sponsor: N/A
IRB/IACUC#: 2011-089

414 - Poster **Classification:** Dual Degree student

Presenter: Noah P Jouett **Department:** Institute for Cardiovascular and Metabolic Disease

Authors: Noah Jouett, UNT Health Science Center; Kaethan Bysani, UNT Health Science Center; Daniel Cooley, UNT Health Science Center; Michael J. Cutler, Intermountain Heart Institute; Peter B. Raven, UNT Health Science Center; Michael L. Smith, UNT Health Science Center

Brief Exposure to Intermittent Hypoxia Prolongs QTc in Human Subjects, which is Abrogated with AT1a Receptor Blockade.

Purpose: Patients with Obstructive Sleep Apnea (OSA) frequently succumb to sudden cardiac death (SCD). Prolongation of the QTc, possibly via intermittent hypoxia (IH) mediated activation of angiotensin II type 1a receptors (ATR1a), predisposes towards SCD. Hence, the present study tested the hypothesis that (1) a brief exposure of IH lengthens QTc which (2) is abrogated with Losartan, an antagonist of ATR1a. Further, we evaluated how Losartan affects the relationship between direct measurements of muscle SNA (MSNA) and QTc via linear regression analyses during IH.

Methods: Seven healthy human subjects were recruited with normal 12-lead ECGs. Subjects ingested either placebo or 100 mg of Losartan 1 hour prior to experimentation, and then repeated the study on a separate day in a randomized, repeated measures design. 3-lead ECG and MSNA (peroneal microneurography) were recorded throughout the study. Subjects were exposed to 20 minutes of IH, which was composed of 20 cycles of the following: 2-3 breaths of 95-100% N_2, 20-second end-expiratory apnea, and 40-second room-air recovery. QTc (determined by Bazett's formula) averages were compared statistically using a repeated-measures ANOVA.

Results: Losartan did not alter baseline QTc ($P = 0.17$). IH + Placebo significantly prolonged QTc (baseline: 359.8 ± 4.8 ms vs. IH: 368.3 ± 4.8 ms, $P < 0.001$). Losartan abrogated the IH-mediated QTc prolongation (baseline: 364.5 ± 5.7 ms vs. IH: 367 ± 6.4 ms, $P = 0.11$). Furthermore, changes in MSNA explained only 6% of the variance in QTc during IH with Placebo, which increased to 22% with IH and Losartan (IH + Placebo: $R^2 = 0.06$, IH + Losartan: R^2: 0.22).

Conclusions: IH prolongs QTc, which is prevented with Losartan . Furthermore, IH alters the relationship of MSNA and QTc, in part through activation of ATR1a. Future studies should evaluate the possible cardioprotective benefits of ATR1a antagonists in OSA patients.

Sponsor: N/A
IRB/IACUC#: 2016-007

415 - Poster **Classification:** TCOM DO Student

Presenter: Sanaa Karim **Department:** Research

Authors: Sanaa Karim, UNT Health Science Center; George Taffet, Baylor College of Medicine; Deepak Acharya, Baylor College of Medicine; Anilkumar Reddy, Baylor College of Medicine; Poornima Yechoor, Baylor College of Medicine; Thuy Pham, Baylor College of Medicine; Jesus Hermosillo, Baylor College of Medicine; Craig J. Harley, Baylor College of Medicine; Janice Knebl, UNT Health Science Center

Diastolic Properties in Older Mice: Comparison Between C57Bl6J and C57BL6N

Purpose: Cardiac aging in both humans and mice is associated with diastolic dysfunction, and impairment of the left ventricle filling. Age-related factors contributing to this filling impairment include fibrosis of the ventricle and impaired calcium handling by cardiomyocytes. Most aging studies use the C57Bl6/J (J mouse), but the C57Bl6/N (N mouse) has similar longevity without extensive cardiac fibrosis at comparable ages. Hence, this study is designed to identify the effect of fibrosis on diastolic function.

Methods: We performed Doppler and 2-D echocardiography on fourteen 29 months old C57B16 (J and N's) mice under 1% Isoflurane. The parameterized diastolic filling (PDF) formalism was used to comprehensively evaluate the diastolic dysfunction modeling the ventricle as a damped spring with spring stiffness (k), damping constant (c), initial stretch (x_0). Small doses of Ivabradine were given to control heart rate for this assessment.

Results: The N mice showed a c value of 205 ± 15, k of 7940 ± 530 and a x_o of -.23 ± .004 in comparison to the J mice that showed a c value of 195 ± 14, a k value of 10,420 ± 800 and a x_o value of -.016 ± .001.

Conclusions: Though systolic function was preserved in old N's and J's, the spring stiffness (k) was significantly higher for the old J's. This suggests fibrosis stiffens the old heart dramatically, but the larger LV diameter in the N's suggests that fibrosis may prevent chamber enlargement with aging.

Sponsor: Baylor College of Medicine, American Geriatric Society
IRB/IACUC#: AN-4776

416 - Poster **Classification:** TCOM DO Student

Presenter: Maham Munawar **Department:** UNT Health

Authors: James Kuo MD, Cook Children's Medical Center; Tyler Hamby MD, Cook Children's Medical Center; Maham Munawar, UNT Health Science Center

Mid- And Long-Term Follow Up Of Repeat Right Ventricular Outflow Tract Reconstruction Using The Medtronic Freestyle Porcine Aortic Root

Purpose: A stentless porcine aortic root bioprosthesis has been primarily used at Cook Children's Medical Center (CCMC) for right ventricular outflow tract (RVOT) reconstruction. The purpose of this research was to quantify longevity of the Medtronic Freestyle Porcine Aortic Root and the predictors of its longevity.

Methods: A retrospective chart review was conducted of all RVOT reconstructions using porcine aortic root at CCMC between 2002 and 2015. Patients who had a Ross procedure or who were lost to follow up within one year were excluded. For each patient, gender, age, weight, body surface area (BSA), and valve size were abstracted from medical charts. Additionally, survival and reintervention data were captured. Overall freedom from earlier reintervention was assessed using the Kaplan-Meier method. Predictors of longevity were examined with Cox regression.

Results: There were 194 operations performed on 188 patients. Excluding patients with Ross procedures, those lost to follow up, and three patients who had died from unrelated causes, 163 patients were examined. Thirty-eight patients (23.3%) required earlier reintervention. The 5-year freedom from reintervention rate was 93.2% (95% CI 86.7-96.6%), and the 10-year rate was substantially lower at 48.4% (95% CI 34.9-60.6%). Regression analyses revealed that age <10 >years, weight <39 >kg, BSA <1.2, and valve size < 25 mm were each significantly associated with shorter longevity.

Conclusions: These data suggest that younger and smaller patients are significantly more likely to require earlier reintervention, but sex is not affiliated with need for earlier reintervention. Upon comparison to other studies, the Freestyle valve's longevity is comparable to alternative valve replacements.

Sponsor: N/A
IRB/IACUC#: CCHCS IRB 2015-023

417 - Poster **Classification:** School of Health Professions Student
Presenter: Samantha McCormick **Department:** Physician Assistant Studies
Authors: Samantha McCormick, UNT Health Science Center; Jenna Burchfield, UNT Health Science Center; Bethany Krawietz, UNT Health Science Center; M. Meagan Raschke, UNT Health Science Center; Jessica L. Hartos PhD., UNT Health Science Center

For Heart Disease, Do Depression Rates Differ Between Middle-aged and Elderly Males?

Purpose: Depression is a debilitating mental illness that has consistently been linked to heart disease, but depression rates between age groups in people within this population are unknown. Therefore, the purpose of this study was to assess whether depression rates differ between middle-aged and elderly males with cardiac disease.

Methods: This cross-sectional analysis utilized 2014 BRFSS data for males 35 and older who have ever been diagnosed with heart disease from Arkansas, Kentucky, Louisiana, and Oklahoma. Multiple logistic regression analysis was used to assess the relationship between depression rates and age while controlling for ethnicity/race, employment status, weight status, exercise, alcohol use, and tobacco use.

Results: In this target population, approximately a quarter of the participants reported ever being diagnosed with depression or dysthymia (24-28%) and the majority were 65 and older (63-69%). Depression was about three to four times less likely to be reported in males ages 65 years and older diagnosed with heart disease compared to those 35 to 64 in three out of four states.

Conclusions: Overall, this study found that middle-aged males with cardiac disease reported higher rates of depression than their elderly counterparts. The major limitation of this study was the inability to assess the onset of diagnoses or comorbid health conditions over time. General practitioners can expect that roughly a quarter of their male cardiac patients will report depression and that these rates might be higher among unemployed individuals. Primary care providers should assess their male cardiac patients ages 35 and above for depression, especially the younger patients in this group.

Sponsor: N/A
IRB/IACUC#: 2016-074

418 - Poster **Classification:** Dual Degree student

Presenter: Dianna H. Nguyen **Department:** Institute for Cardiovascular and Metabolic Disease
Authors: Dianna Nguyen, UNT Health Science Center; Mirza Beig, UNT Health Science Center; Sharon Ellazar, UNT Health Science Center; Steve Mifflin, UNT Health Science Center

Quantification of Nucleus Tractus Solitarius Neurons Projecting to Hypothalamic Paraventricular Nucleus

Background: Nucleus tractus solitarius (NTS) neurons integrate and relay visceral afferent inputs to various sites in the brain, notably the hypothalamic paraventricular nucleus (PVN). Understanding connectivity between the NTS and PVN will provide insight into possible interactions between the two areas in normal and pathophysiology.

Purpose: To quantify the number of NTS neurons that project to the PVN using the retrograde transport agent cholera toxin B (CTB).

Methods: Adult male Sprague-Dawley rats (n=3) were anesthetized intraperitoneally with ketamine (75mg/kg) and Dexdomitor (0.5mg/kg) then placed in a stereotaxic frame. Under aseptic conditions, the cranium overlying the PVN was exposed. Using a glass electrode, 100nL of 0.25% CTB in isotonic saline was slowly injected into the PVN bilaterally and the electrode withdrawn after 5 minutes. The skin was sutured and animals were allowed to recover. Three weeks later, the rats were transcardially perfused with 4% paraformaldehyde and their brains were harvested. PVN sections (40um thick) were used to verify the injection site. NTS sections (40um thick) were processed using immunohistochemistry. Polyclonal anti-CTB antibody (1:2000, Millipore) and secondary antibody Cy3 Donkey Anti-Goat (1:800, Jackson ImmunoResaerch Laboratories, Inc.) were used to visualize NTS neurons with axonal projections to PVN. Monoclonal anti-tyrosine hydroxylase (TH) antibody (1:1000, Millipore) and secondary antibody Alexa Fluor 488 Donkey Anti-Mouse (1:800, Jackson ImmunoResearch Laboratories, Inc.) were used to visualize catecholaminergic neurons. The number of CTB-immunoreactive, TH-immunoreactive, and co-labeled CTB and TH neurons were counted manually using Image J. Analysis was restricted to those NTS sections that had CTB-immunoreactivity and ranged from 15-21 sections each in the 3 rats. CTB injection sites were within the boundaries of the PVN.

Results: We found 110±6 CTB immunoreactive and 346±33 TH immunoreactive neurons in NTS. 29±5 neurons were dual labeled with CTB and TH immunoreactivity indicating catecholaminergic NTS neurons projected to PVN.

Conclusions: The majority of NTS neurons that project to PVN appear to be non-catecholaminergic. Approximately 10% of catecholaminergic NTS neurons project to PVN. Results will be useful in future studies using laser capture microdissection to examine gene expression in NTS neurons that project to PVN under a variety of conditions (e.g., hypoxia, hypertension).

Sponsor: PO1 HL088052
IRB/IACUC#: 2013/14-19-A05

419 - Poster **Classification:** TCOM DO Student

Presenter: Julian Nguyen **Department:** Institute for Cardiovascular and Metabolic Disease
Authors: Julian Nguyen B.S., UNT Health Science Center; Brandon Cherry B.S., UNT Health Science Center; Arthur Williams Jr., B.S., UNT Health Science Center; Jung E. Marianna Ph.D, UNT Health Science Center; Ryou Myoung-Gwi Ph.D, Tarleton State University; Robert T. Mallet Ph.D, UNT Health Science Center

Does Intermittent Hypoxia Training Augment Antioxidant and Anti-Glycation Enzymes in Rat Brain?

Hypothesis: Intermittent hypoxia training (IHT) has been found to minimize damage in the brain of rats subjected to ischemic stroke and alcohol intoxication-withdrawal, but the neuroprotective mechanisms are unclear. The finding that antioxidant treatments during IHT blunt the protection identifies a pivotal role of reactive oxygen species (ROS). Because ROS activate expression of antioxidant and anti-glycation enzymes, this study addressed the hypothesis that IHT augments these enzymes in rat brain. Specifically, the cerebral activities of anti-glycation (glyoxalase-1, i.e. GLO1), anti-oxidant (glucose 6-phosphate dehydrogenase, i.e. G6PDH) and hypoxia-inert (lactate dehydrogenase, i.e. LDH) enzymes were analyzed in IHT and non-hypoxic rats.

Material and Methods: Ten rats (5 males) completed a 20 day IHT program (5-8 daily cycles of 5-10 min exposures to 9.5-10% O_2 followed by 4 min room air exposures), and another 10 rats (5 males) were sham-conditioned by cyclic exposures to 21% O_2. One day after completing the IHT or sham programs, the rats were isoflurane-anesthetized and decapitated. The cerebra were harvested, flash-frozen in liquid N_2, pulverized in a mortar under liquid N_2, homogenized in phosphate buffer, and centrifuged. Enzyme activities in supernatants were analyzed by spectrophotometry, and total protein content by colorimetric Bradford assay.

Results: Activities of GLO1 were 78 ± 8 and 62 ± 7 mU/mg protein in the IHT and sham groups, respectively (P = 0.23). G6PDH activities were 21 ± 2 and 24 ± 2 mU/mg protein in the IHT and sham groups (P = 0.32). As expected, LDH activities were similar in the two groups: 899 ± 49 mU/mg protein in the IHT rats, and 940 ± 58 mU/mg protein in the sham rats (P = 0.60). Thus, IHT did not produce a statistically significant treatment effect on these enzymes.

Conclusions: The 20 day IHT program, which exerts robust cerebroprotection against ischemia-reperfusion and ethanol intoxication-withdrawal, did not augment activities of selective antioxidant and anti-glycation enzymes. The impact of IHT on other antioxidant (e.g. glutathione peroxidase, superoxide dismutase, catalase) and anti-glycation (e.g. glyoxalase-2) enzymes remains to be evaluated. It also is possible that IHT activates other cytoprotective mechanisms, including signaling cascades that ameliorate mitochondrial permeability transition, oxidative stress and other mechanisms of neural injury. Such alternative mechanisms merit investigation.

Sponsor: N/A
IRB/IACUC#: 2014/15-14-A05

420 - Poster **Classification:** TCOM DO Student (Not for Competition)
Presenter: Keegan Olmstead **Department:** Texas College of Osteopathic Medicine
Authors: Keegan Olmstead, UNT Health Science Center; Tyler Hamby, UNT Health Science Center; Steve Muyskens MD, Cook Children's Medical Center

Magnetic Resonance Angiography to Assess Anomalous Coronary Arteries in Children at 3-Tesla: Diagnosis, Risk Stratification, and Interobserver Reliability

Background: Anomalous aortic origin of the coronary arteries (AAOCA) is the second most common cause of sudden cardiac death (SCD) in young athletes. The prevalence, pathophysiology, and optimal method of evaluating AAOCA are unknown. The reliability of coronary magnetic resonance angiography (MRA) in assessing AAOCA, and the use of contrast enhanced coronary MRA in children at 3-Tesla has not been well described. We present our institutional experience using a 3-dimensional (3D) IR-FLASH sequence with slow gadolinium infusion and respiratory navigation at 3-Tesla to diagnose and risk stratify AAOCA in children.

Methods: A retrospective review was conducted of all MRA patients referred for possible AAOCA between January 1, 2011 and May 9, 2016. Patients with complex congenital heart disease were excluded. Coronary anomalies with an intramural or interarterial course were classified as high risk, and a high aortic origin or intraseptal course were classified as low risk. Completed studies were anonymized and evaluated by two blinded independent observers for image quality, diagnosis of AAOCA, intramural course, and interarterial course. Reliability analyses, utilizing kappa, assessed diagnostic agreement between raters. MRA and surgical findings were compared in patients with AAOCA repair.

Results: Fifty-nine patients were referred for suspected AAOCA (median age 13.79 years, range 5.19 – 19.84, 73% male). For 58 successfully acquired angiograms, 31 were high risk, 11 were low risk, and 16 were normal. Overall image quality was rated good to excellent. The two raters showed excellent agreement on image quality, $\kappa = .85$ (93%), diagnosis of AAOCA, $\kappa = .81$ (91%), and diagnosis of proximal interarterial course, $\kappa = .81$ (88%). There was moderate agreement about diagnosis of intramural course, $\kappa = .63$ (74%). For all 11 cases with surgical repair, the combined MRA ratings correctly diagnosed the presence of AAOCA and interarterial course. The presence of an intramural course was correctly rated in all 9 cases, while the absence of an intramural course was correctly rated in 1 of 2 cases.

Conclusions: Coronary MRA using 3D IR-FLASH with slow contrast infusion at 3-Tesla showed high inter-rater reliability for diagnosing and characterizing AAOCA in pediatrics. Furthermore, findings were validated at time of surgical repair. This protocol is an effective means to examine AAOCA in pediatric patients and help stratify those who may be at high risk of SCD.

Sponsor: N/A
IRB/IACUC#: CCHCS IRB 2016-037

421 - Poster **Classification:** TCOM DO Student

Presenter: Ruth Osho **Department:** Cardiology

Authors: Ruth Osho, UNT Health Science Center; Michael Smith, UNT Health Science Center; Hillary Jackson, UNT Health Science Center; Noah Jouett, UNT Health Science Center

Evidence of Underdiagnosis of Sleep Apnea and Associated Abnormal Blood Pressure Control Among Minority Populations

Introduction: Obstructive sleep apnea (OSA) remains to be grossly underdiagnosed in the general population. We have recently shown that chemoreflex control of sympathetic nerve activity as measured by the pressor response to voluntary breathholding is exaggerated in patients with obstructive sleep apnea (OSA) and is highly sensitive for diagnosing OSA (>0.90). In this study, we used the DSAP during volunteer breathholds to determine the pressor responses in a preliminary group of subjects from family medicine clinics who are not diagnosed with OSA. The population included African-Americans (AA), Hispanics (H) or Caucasians (C), and each subject also completed the EPWORTH sleepiness score (ESS) which is a marker of potential risk of OSA.

Methods: Standard auscultatory blood pressure was measured in triplicate during quiet rest and immediately following a 20 sec voluntary end-expiratory breath hold (apnea) in 28 AA subjects, 16 H subjects and 48 C subjects who presented to the family medicine clinic without a diagnosis of sleep apnea. In addition, each subject completed the ESS survey and a score was calculated.

Results: The entire cohort of subjects had reported to the clinic without a diagnosis of OSA. However, the ESS was significantly greater in both the AA and H groups when compared to the C subjects ($p< 0.01$), and the percentage of subjects with an ESS >10 (high risk of OSA) was also significantly greater in the AA and H groups compared with the C cohort ($p < 0.05$). Post-apnea DSAP was also substantially greater in both the AA and H groups ($p < 0.05$) when compared to the C group.

Conclusions: These data derived from a general group of patients reporting to the primary care clinic support the premise that both AA and H individuals tend to be underdiagnosed for OSA and that the measurement of both the ESS and the pressor response to voluntary apnea can provide insights into both the risk of OSA and potential risk of underlying cardiovascular disease.

Sponsor: N/A
IRB/IACUC#: 2011-089

422 - Poster **Classification:** GSBS Student

Presenter: Oluwatobiloba Osikoya **Department:** Institute for Cardiovascular and Metabolic Disease
Authors: Oluwatobiloba Osikoya, UNT Health Science Center; Styliani Goulopoulou, UNT Health Science Center

Uterine Perivascular Adipose Tissue Potentiates Vasoconstriction in Maternal Arteries During Rat Pregnancy

Background: Perivascular adipose tissue (PVAT) functions mostly to increase vasodilation in healthy conditions, but increases vasoconstriction in diseased states. During pregnancy, adipose tissue expands, and uterine arteries (UTA) undergo substantial remodeling. Previously, our laboratory showed that uterine PVAT potentiates contractile responses in UTA from pregnant but not in arteries from non-pregnant rats. It is unknown, however, if the effects of uterine PVAT are vascular bed specific and if they are mediated by pregnancy.

Hypothesis: Uterine PVAT potentiates contractions in maternal arteries independently of vascular bed and this pro-contractile property is mediated by pregnancy specific factors.

Methods: Sprague-Dawley pregnant rats were sacrificed on gestational day 16 (term=21-22) and aged-matched non-pregnant rats were used as controls. Uterine PVAT, and isolated segments of UTA and mesenteric arteries (MES) mounted onto a wire myograph. To determine whether uterine PVAT has pro-contractile effects independently of vascular bed, pregnant UTA and MES were incubated with uterine PVAT (0.1 g) for 30 minutes. To determine whether the pro-contractile effects of uterine PVAT are mediated by pregnancy specific changes, UTA from pregnant and non-pregnant rats were incubated for 30 minutes with non-pregnant PVAT (0.1 g) and pregnant PVAT (0.1 g), respectively. Concentration response curves to potassium chloride (KCl, 4.7 – 80 mM) were performed in all arteries. Force generated at each KCl concentration was expressed in mN and area under the curve (AUC) was used to quantify total contraction.

Results: MES from pregnant rats had increased contractile responses to KCl when incubated with uterine PVAT (AUC, -PVAT: 366±46 vs. +PVAT: 529±53, P = 0.02). UTA from pregnant rats had increased contractile responses to KCl when incubated with uterine PVAT (AUC, -PVAT: 893±40 vs. +PVAT: 1092±59, p=0.004). Preliminary data showed that PVAT from non-pregnant rats increased contractile responses in UTA from pregnant rats (KCl 30 mM, -PVAT: 4.7±0.9 mN vs. +PVAT: 11.4±1.4 mN, p=0.047). Pregnant PVAT had no effect on UTA from non-pregnant rats (p>0.05).

Conclusions: Uterine perivascular adipose tissue potentiates vasoconstriction in both uterine and mesenteric arteries from pregnant rats. These effects may be due to vascular remodeling during pregnancy.

Sponsor: UNTHSC Pilot Grant
IRB/IACUC#: 2013/14-40-A05

423 - Poster **Classification:** Postdoctoral Fellow (Not for Competition)

Presenter: Sebastian Requena **Department:** Biomedical Sciences

Authors: Sebastian Requena, UNT Health Science Center; Janhavi Nagwekar, UNT Health Science Center; Vipulkumar Patel, UNT Health Science Center, Texas Tech University Health Science Center El Paso; Rafal Fudala, UNT Health Science Center; Zygmunt Gryczynski, Texas Christian University; Ignacy Gryczynski, UNT Health Science Center; Julian Borejdo, UNT Health Science Center

Differences in Actomyosin Function in the Left and Right Ventricles of Human Hearts

Purpose: In both ventricles of the heart, actin is expressed from the same genes. There are no differences in twitch duration, work performance, and power among the right (RV) and left (LV) ventricles in animals. So there is no expectation that the properties of actin or myosin isolated from either ventricle would be different. Nevertheless, the situation is more complex in human hearts. The LV must pump more powerfully because it has to overcome a larger resistance presented by the systemic system than the RV, which has to overcome a lower resistance offered by the pulmonary system. The question arises whether stronger pumping action of the LV is partially caused by the LV actomyosin developing more force than the RV actomyosin. The goal of this work is too identify if there are any differences in the kinetics rates of the actomyosin mechanochemical cycle in the LV versus the RV.

Methods: Such a question is impossible to answer by making macroscopic measurements such as tension or ATPase activity, because the number of molecules involved in these processes is too large, (of the order of 10^{11}) Measurements must be taken from a few molecules. We measured variations in the polarization of fluorescence of a few actomyosin molecules during the contraction cycle using time-resolved single molecule fluorescent microscopy. We obtained molecular kinetic information by calculating its autocorrelation function using R (version 3.3.1). The autocorrelation curve was fitted with a bi-exponential decay model to extract the rate constants using XPFIT (version 1.2.1) The goodness of fit was assessed by chi-squared.

Results: The results suggest that actomyosin function is identical in both ventricles. There are no statistically significant differences in the kinetic rates that we obtained. Additionally, the spatial distribution of actomyosin is also the same.

Conclusions: Our results suggest that the differences in the LV and RV may not be due to differences at the molecular level between actomyosin from the LV or RV in human hearts. However, our study only involved the use of failing human hearts with a wide variety of clinical parameters. These differences in the type of heart failures and patients may mean that we will not be able to extract statistically different results between kinetic rates. We have begun working on non-failing human hearts and will see if differences are present in that case.

Sponsor: N/A
IRB/IACUC#: N/A

424 - Poster **Classification:** TCOM DO Student

Presenter: David White **Department:** Institute for Cardiovascular and Metabolic Disease
Authors: David White III, UNT Health Science Center; Xiaoli Liu III, UNT Health Science Center; Ebunoluwa Akinbola, UNT Health Science Center; Xiangrong Shi, UNT Health Science Center

Overshoot in Cerebral Perfusion Following Release of Simulated Obstructive Apnea

Purpose: The purpose of this study was to examine and quantify the hypothesis that there is a surge in cerebral perfusion and arterial pressure, following the release of the modified Mueller maneuver.

Methods: Nine healthy men (28 ±1 yr old) performed the Mueller maneuver (attempted inspiration against closed glottis after a forced expiration) and the modified Mueller maneuver (attempted inspiration against closed glottis after a normal expiration) for 15 seconds, respectively, in a random order. The study was approved by the IRB at UNTHSC (Project #2013-121). Heart rate (HR), mean arterial pressure (MAP), cerebral blood flow velocity of the middle cerebral artery (V_{MCA}), arterial oxygen saturation (SaO_2) and cerebral tissue oxygen saturation (ScO_2) were continuously measured during the maneuvers. Cerebral vascular resistance index (CVRI) was estimated from the ratio of MAP/V_{MCA}. Changes in the hemodynamic parameters were assessed during the first and last 5 seconds of simulated obstructive apnea, respectively, and the first 5 seconds after release of the apnea.

Results: Variables were extrapolated to examine percent change from baseline for the first 5 seconds of the maneuver, last 5 seconds of the maneuver, and the release of the maneuver. Neither regular, nor modified, maneuvers elicited significant changes in cardiovascular variables. After the release of the maneuvers, however, both MAP and V_{MCA} were significantly augmented. A significant decrease in CVRI was present after the Mueller maneuver.

Conclusions: In conclusion, there is a surge in V_{MCA} associated with an overshoot of MAP following release of simulated obstructive apnea. This sudden increase in cerebral perfusion seems to be driven by an augmented perfusion pressure in the modified Mueller maneuver. This study indicates that obstructive apnea simulated by either regular or modified Mueller maneuvers may lead to instability of cerebral perfusion during the initial phase of resuming breathing.

Sponsor: TCOM Scholarship
IRB/IACUC#: Project #2013-121

425 - Poster **Classification:** School of Health Professions Student

Presenter: Jamie Williams **Department:** Physician Assistant Studies

Authors: Jamie Williams PA-S, UNT Health Science Center; Alycia Braithwaite PA-S, UNT Health Science Center; Erin Rutledge PA-S, UNT Health Science Center; Hayley M. Tannery PA-S, UNT Health Science Center; Jessica Hartos PhD., UNT Health Science Center

For General Health, is Heavy Alcohol Use Related to Heart Disease in Adult Woman Aged 45-64?

Introduction: Heart disease and general alcohol use are leading health concerns in the general population, but little is known about the relationship between heart disease and heavy alcohol use in women aged 45-64. The purpose of this study was to assess the relationship between heavy alcohol use and heart disease in middle-aged women.

Methods: This cross sectional analysis used 2014 BRFSS data for females ages 45-64 from Arkansas, Kentucky, Louisiana, and West Virginia. Multiple logistic regression analysis was used to assess the relationship between lifetime heart disease and heavy alcohol use while controlling for age, ethnicity, marital status, income level, exercise, weight status, diabetes, and tobacco use.

Results: A small percentage of female participants aged 45-64 reported lifetime heart disease (6-8%) or heavy alcohol use (2-6%). After controlling for demographic factors, heart disease was not significantly related to heavy alcohol use in any of the four states. However, heart disease was significantly related to exercise in AR, KY, and WV, and significantly related to diabetes in KY and LA.

Conclusions: In summary, heart disease was not significantly related to heavy alcohol use but was significantly related to exercise and diabetes in general population samples of women aged 45-64. Although this study was limited by poorly defined variable measurements and a lack of direction of influence, it is recommended that primary care providers screen and educate their middle-aged female patients on the relationship between heart disease, exercise and diabetes. Given low prevalence of heart disease in the target population and lack of significant relationship between heart disease and heavy alcohol use, it is not indicated to screen for heart disease and heavy alcohol use in every middle-aged woman. Screening for either is recommended if the patient presents with symptoms.

Sponsor: N/A
IRB/IACUC#: 2016-074

Case Presentation (Abstracts in the 500s)

500 - Poster **Classification:** TCOM DO Student
Presenter: Sam Ahn **Department:** Texas College of Osteopathic Medicine
Authors: Sam Ahn, UNT Health Science Center; Paul Thornton, Cook Children's Medical Center; Luke Hamilton, Cook Children's Medical Center; Zahid Ahmad, Cook Children's Medical Center; Don Wilson, Cook Children's Medical Center

Gynecomastia and Partial Androgen Insensitivity Syndrome (PAIS)

Purpose: Partial androgen insensitivity syndrome (PAIS) is a rare genetic disorder, with a prevalence of 1:130,000. Caused by a loss-of-function mutation in the androgen receptor (AR) gene located on the X-chromosome, PAIS is clinically characterized by hypospadias, gynecomastia, and infertility due to azoospermia.Phenotypic manifestations often overlap with other genetic disorders. Therefore, genetic screening can not only help provide a definitive diagnosis, but can also assure accurate genetic counseling – especially for female carriers.

Case Presentation: A 13-year-old male Caucasian was referred for gynecomastia. His past medical history was unremarkable, except for attention deficit hyperactivity disorder. Family history included cancer, cardiovascular disease, and obesity. On physical exam, his penis was underdeveloped while his pubic hair was Tanner 3. He had large well-formed breasts similar to Tanner 4 in females. His testicles were 6 mls. Laboratory testing revealed elevated serum testosterone of 1610 ng/dL, LH 4.75 mIU/mL, FSH 0.57 mIU/mL and estradiol 17 pg/mL. His initial lab results were consistent with (partial) androgen insensitivity syndrome. Following 10 mg/d of tamoxifen, his breast tissue dissappeared completely and the drug was discontinued. Within a year, significant breast hypertrophy was again noted and tamoxifen was resumed. With further treatment, his gynecomastia once again resolved. F-up lab results showed continued elevation of serum testosterone of 1678 ng/dL with LH levels of 20.24 mIU/mL, and estradiol of 73 pg/m. FSH levels remained normal (2.66 mIU/mL). Genetic testing confirmed a known mutation for PAIS. The patient was advised to continue tamoxifen. Whole exome sequencing was completed (illumina HiSeq 2000, McDermott Center Sequencing Core at UT Southwestern Medical Center, Dallas, TX) from DNA isolated from peripheral blood. The patient harbored a missense mutation (A700D) in the AR gene. Sanger sequencing was completed to confirm the mutation. His mother was heterozygous for the mutation while his father and unaffected brother lacked the mutation.

Summary: Gynecomastia, the proliferation of male breast tissue, may occur as a consequence of physiologic or pathologic causes. Although physiologic gynecomastia commonly associated with male puberty resolves spontaneously, pathologic causes often result in persistent breast enlargement, accompanied by tenderness and, in some, galactorrhea. Further diagnostic testing is recommended in those with persistent, unexplained gynecomastia. Current treatment options for PAIS are limited to symptomatic management. Genetic and psychological counseling, and hormone replacement therapy should be proved.4,5 Affected males with hypospadias may benefit from assistance with sex assignment, genitoplasty and gonadectomy.

Conclusions: Overall, PAIS is often overlooked due its rarity and may be confused with other genetic disorders with similar clinical presentations. As such, PAIS should be included in differential diagnosis of

children who present with abnormal secondary sexual organ development or ambiguous genitalia. Individuals with PAIS should be managed by a multidisciplinary team to assure the best outcomes.

Sponsor: N/A **IRB/IACUC#:** CCHCS IRB

501 - Poster **Classification:** TCOM DO Student
Presenter: Tyler Reed **Department:** Family Medicine
Authors: Ashlea Feezel, UNT Health Science Center; Tyler Reed, UNT Health Science Center; David Schulze, UNT Health Science Center; Long Wong, UNT Health Science Center

Williams-Beuren Syndrome: A Case Report

Background: Williams-Beuren Syndrome (WBS), is a disorder caused by a hemizygous deletion of genes located on chromosome 7q11.23. Although, the deletion ranges in size from 1.55Mb to 1.85Mb, the elastin gene, ELN, is lost in all affected individuals. A wide variety of clinical manifestations have been seen among WBS patients including cardiovascular defects, cognitive impairment, and a distinctive facial features. The condition is usually diagnosed clinically at birth then confirmed with genetic testing. Due to the multisystem involvemnt of WBS, patient care is usually managed by multiple subspecialists. Accompanying psychosocial concerns frequently arise due to the low IQ and developmental delay seen in most WBS patients. In this report, we offer an overview of WBS and the complex management of 25-year old female with previously diagnosed WBS and multiple comorbid conditions.

Purpose: In this report, we offer an overview of Williams-Beuren Syndrome and the complex management of 25-year old female with previously diagnosed WBS and multiple comorbid conditions.

Methods: Chart review

Results: The majority of the patient's care was managed by her primary care physician including continuation of current treatment, hospital follow ups, medication management and involving social work as needed.

Conclusions: This case demonstrates a primary care physician's management of a complex genetic disorder due to limited access to subspecialists.

Sponsor: N/A
IRB/IACUC#: 2016-158

502 - Poster **Classification:** TCOM DO Student
Presenter: Ashlea Feezel **Department:** Pediatrics
Authors: Ashlea Feezel, UNT Health Science Center; Fernando Acosta, Cook Children's Medical Center

Acute Necrotizing Encephalopathy: Case Report

Background: Acute Necrotizing Encephalopathy (ANE) is a rare disease that follows viral infections, most commonly influenza. Patients present with altered mental status and rapidly progress into a comatose state. Characteristic bilateral thalamic and brainstem lesions are seen on magnetic resonance imaging scans. Most early cases were isolated to East Asian countries such as Japan and Taiwan, with very few cases reported in the United States and Europe.

Results/Conclusions: Recent studies of sporadic and familial cases of ANE have found a missense mutation in the Ran Binding Protein 2 (RANBP2) gene. We describe the clinical and radiological findings and treatment of a 14 year old female with recurrent RANBP2 positive ANE.

Sponsor: N/A
IRB/IACUC#: CCHCS IRB

503 - Poster **Classification:** Resident
Presenter: Glenn Klucka **Department:** Osteopathic Manipulative Medicine
Authors: Glenn Klucka, UNT Health Science Center; Todd Dombroski, UNT Health Science Center

OMT Reduced Pain in a Metastatic Cancer Patient: A Case Report

Purpose: Patients diagnosed with metastatic cancer frequently have chronic musculoskeletal pain associated with their disease. This case report describes the treatment with Osteopathic Manipulative Treatment(OMT) of a 31 year old female with breast cancer - metastatic to the thoracic spine and ribs. Four treatments significantly increased Activities of Daily Living(ADL) and decreased pain with decreased narcotic need.

Methods: A 31 year old Female diagnosed in January 2012 with Stage 4 breast cancer with metastases to the thoracic spine presented with chronic back and Left shoulder pain. Her pain was severe with difficulty tolerating light touch, but consented to evaluation and treatment. Initial examination showed T4 FRrSr, thoracic outlet strain, Right inferior 12^{th} rib, sternum restriction, Right quadratus lumborum hypertonicity, and internally rotated Left humerus. Prior to treatment potential risks and benefits were discussed and patient agreed to OMT. OMT techniques used included myofascial release and BLT.

Results: After just four treatments in 10 weeks, the patient's left shoulder/thoracic outlet/T-spine rib was significantly less, resolved constipation, and decreased narcotic use. More importantly, she could shower without pain or assistance and she drove herself to the last appointment. No adverse events were noted during the time of treatment.

Conclusions: OMT can have positive clinical effects on pain and ADLs in a cancer patient. Further research is needed to determine the relative contra-indications versus benefit over a longer time.

Sponsor: N/A
IRB/IACUC#: 2017-027

504 - Poster **Classification:** TCOM DO Student
Presenter: Missy Lalich **Department:** Texas College of Osteopathic Medicine
Authors: Missy Lalich, UNT Health Science Center; Paul Bowman, UNT Health Science Center

Metastatic Spindle Epithelial Tumor with Thymus Like Differentiation in a 10 Year Old Male

Purpose: This case study highlights a rare experience of late recurrent pulmonary metastatic Spindle Epithelial Tumor with Thymus-Like Differentiation (SETTLE) following an initial diagnosis of SETTLE of the thyroid. The case illustrates the clinical features of metastatic SETTLE and emphasizes the importance of long term patient follow up after a diagnosis of childhood cancer.

Methods: Chart and literature reviews were performed with an emphasis on clinical presentation and treatment protocol for metastatic SETTLE. Records were obtained of a 10-year-old male who presented to Cook Children's Medical Center with multiple bilateral pulmonary nodules on x-ray and a history significant for a SETTLE tumor of the thyroid 5 years prior. Due to situational adversities, the patient was lost to follow up and was not seen by an oncologist following his initial diagnosis with SETTLE.

Results: Cook Children's Medical Center Oncologist reviewed the radiologic reports and proceeded with core needle biopsy of the pulmonary masses to identify an etiology. The pulmonary biopsies were compared to the patient's initial thyroid tumor specimen and a diagnosis of metastatic SETTLE was established. Due to the rare nature of this disease, no formal treatment protocols currently exist for metastatic SETTLE. Cook Oncologist decided to proceed with a chemotherapy protocol consistent with literature recommendations for metastatic pulmonary SETTLE.

Conclusions: The present case is an example of a rare tumor that has the potential to demonstrate late onset metastatic disease. With little known about the disease course, subsequent follow-up with an oncologist after diagnosis is of the utmost importance to help monitor for tumor recurrence and metastatic disease. As demonstrated by this case, failure to identify secondary metastatic disease at an earlier stage resulted in multiple, non-resectable pulmonary tumors. This case further highlights the importance of patient enrollment in childhood cancer survivorship programs, which can help identify late onset metastatic cancer and secondary malignancies.

Sponsor: N/A
IRB/IACUC#: CCHCS IRB

505 - Poster **Classification:** TCOM DO Student
Presenter: Lauren Lyssy **Department:** UNT Health Pediatrics
Authors: Lauren Lyssy, UNT Health Science Center; Meredith Brooks, Cook Children's Medical Center; Tyler Hamby, UNT Health Science Center

Efficacy of Celiac Plexus Blocks for Pain Control in Pediatric Patients with Visceral Hyperalgesia

Objective: Visceral hyperalgesia (VH) is a condition characterized by increased sensitivity to painful stimuli, which often results in chronic abdominal pain. Irritation of the abdominal organs (associated with gastrointestinal disorders or an idiopathic etiology) modifies efferent neural transmission, resulting in hypersensitization of the viscera and a modified pain response. Symptoms classically include nausea, vomiting, bloating, and altered bowel habits. There are currently no diagnostic tests or standard treatments available. Present therapy for VH utilizes a multidisciplinary approach involving anti-neuropathic medications, behavioral therapy, and dietary modifications. There is some evidence that celiac plexus blocks (CPBs), typically employed for abdominal pain relief in adults and pediatric cancer patients, are effective for control of refractory visceral pain. In this study, we examined the effect of CPBs for control of chronic abdominal pain. To the best of our knowledge, this is the first report examining pain management in pediatric patients with VH.

Materials and Methods: Three patients underwent CPBs at Cook Children's Medical Center to treat VH: 1 case was associated with Crohn's disease and 2 with hereditary pancreatitis. The subjects (2 females and 1 male) were all Caucasian and between the ages of 14- and 19-years old. A retrospective chart analysis was conducted to assess pain scores for the 2 days surrounding the CPB and to document the duration of pain relief.

Results: All 3 patients experienced significant reduction in abdominal pain after the CPB. Follow-ups were conducted via telephone calls and office visits. Duration of pain relief varied from 4 to 19 weeks, before the patient experienced a relapse, which we defined as the recurrence of severe abdominal pain that necessitated a hospital admission.

Conclusions: Due to the significant degree of pain relief, we suggest that CPBs be considered for pain management in pediatric patients with VH, as an addition to their multidisciplinary therapy. However, clinical follow-ups must be maintained as the duration of pain relief can vary widely. As this case study examined only three patients, further research is needed to corroborate these findings.

Sponsor: N/A
IRB/IACUC#: CCHCS IRB

506 - Poster **Classification:** TCOM DO Student (Not for Competition)
Presenter: James B. Meiling **Department:** Texas College of Osteopathic Medicine
Authors: James Meiling BS, UNT Health Science Center; W. Bowman BS, UNT Health Science Center; Matthew Mayfield MD, Cook Children's Medical Center

Simultaneous Bilateral Valgus Slipped Capital Femoral Epiphysis in an 11-Year-Old Girl: A Case Report

Introduction: Slipped capital femoral epiphysis (SCFE) is a unique emergent hip disorder that afflicts children and teenagers. The most common presentation of SCFE is varus slip, a posterior and inferior displacement of the proximal femoral epiphysis on the femoral metaphysis; however, SCFE also presents less frequently as a valgus slip, a posterior and lateral displacement. Bilateral SCFE happens even less often than unilateral SCFE, so a case of simultaneous bilateral valgus SCFE is unique.

Methods: This case was identified and reviewed using electronic medical records and imaging.

Results: An 11-year-old normal weight girl presented with simultaneous bilateral valgus SCFE. She underwent bilateral in situ pinning to prevent further slippage, but post-surgery rapidly developed acute right hip pain caused by retained hardware that inadvertently entered the acetabulum and protruded into the inner wall of the pelvis. An additional operation took place where surgeons dislocated her right hip to remove the retained screw and revised pinnings of both hips. She faced numerous complications, including decreased sensation and numbness on the dorsum of her right foot and decreased peroneal distribution. Almost two years later she continues to experience progressive right hip pain, pinpointed to the tip of the greater trochanter on the lateral aspect of her right hip. The hardware irritation pain resolved after the removal of symptomatic hardware in the right hip. However, she still complains of severe radiating right hip pain on the anterior aspect of her hip, which displays significant acetabular dysplasia and a small cystic area on MRI.

Conclusions: Valgus SCFE remains an infrequent presentation of this already uncommon musculoskeletal adolescent disorder, showing up in only 1-2% of all SCFE cases.According to the literature, simultaneous bilateral valgus SCFE in a female might be anticipated, but because of the infrequency of such cases the nature of both the presentation and demographics are still being discovered and understood. Usually, SCFE presents as a unilateral slip, although patients can have either sequential or simultaneous bilateral slips. In fact, most studies show that approximately 35% of SCFE cases present as bilateral slips. Some results have suggested that bilateral slips may be more common in valgus SCFE than in varus SCFE. More specifically, bilateral valgus SCFE might typically present simultaneously, rather than sequentially.

Sponsor: N/A
IRB/IACUC#: CCHCS IRB

507 - Poster **Classification:** TCOM DO Student

Presenter: James B. Meiling **Department:** Texas College of Osteopathic Medicine
Authors: James Meiling BS, UNT Health Science Center; W. Bowman BS, UNT Health Science Center; Matthew Mayfield MD, Cook Children's Medical Center

A Comparison of Varus And Valgus Slipped Capital Femoral Epiphysis: A Case Series

Introduction: Slipped capital femoral epiphysis (SCFE) is an infrequent adolescent hip disorder. The most common presentation of SCFE is varus slip, a posterior and inferior displacement of the proximal femoral epiphysis on the femoral metaphysis; however, SCFE also presents less frequently as a valgus slip, a posterior and lateral displacement. SCFE is often first seen by a family physician before prompt referral to an orthopedist. The family physician's immediate recognition and diagnosis of this emergent condition is crucial.

Methods: These cases were identified and reviewed using electronic medical records and imaging.

Results: Case 1 is an 11-year-old obese boy with pain for several months due to left unilateral varus SCFE. Surgical management consisted of situ pinning and prophylactic pinning in the contralateral right hip. Case 2 is a 12-year-old obese boy with acute traumatic pain who had right unilateral varus SCFE, was managed with in situ pinning, and has suspected pre-slippage of the contralateral left hip. Case 3 is an 11-year-old non-obese girl with acute pain who had simultaneous bilateral valgus SCFE, underwent in situ pinning twice because of hardware complications, and later required removal of previously placed hardware.

Conclusions: Varus SCFE tends to occur more often in males and valgus slips tend to occur more in females. Body mass index (BMI) seems to show little indication on whether the slip will be varus or valgus. Varus slips commonly present unilaterally with the potential to progress to sequential bilateral slips, while valgus slips have a greater probability of presenting as simultaneous bilateral slips.

Sponsor: N/A
IRB/IACUC#: CCHCS IRB

508 - Poster **Classification:** TCOM DO Student

Presenter: Reema Patel **Department:** Pediatrics

Authors: Reema Patel, UNT Health Science Center; Linda Margraf, Cook Children's Medical Center; Claudia Soler-Alfonso MD, Cook Children's Medical Center; Tyler Hamby PhD, Cook Children's Medical Center; Luke Hamilton MS, Cook Children's Medical Center; Don P. Wilson MD, Cook Children's Medical Center

Role of Perimortem Testing and Autopsy in Children with Unexplained Illnesses

Introduction: Genetic disorders that result in death pose a difficult challenge, as the cause of death often remains unknown. The family is left with unanswered questions and other affected children or family members may be as risk.

Case Presentation: An 8-year-old male experienced a series of unexplained illnesses over 2 year period prior to his death. During this time he had 6 episodes of acute illness requiring hospital care, each characterized by severe headache, emesis, and dehydration. During his last episode, rapid deterioration in his condition prompted transfer to the Cook Children's Medical Center ICU. A head CT showed bilateral cerebral edema with herniation. His neurologic exam met established criteria for brain death and, after consultation with the family, artificial life-support was discontinued and the child expired. The parents consented to an autopsy. Generalized hyperpigmentation was noted at autopsy. Gross and anatomic examination of the autopsy specimens showed bilateral abnormalities of the adrenal glands, suggestive of adrenoleukodystrophy (ALD). Based upon the autopsy findings, the limited blood sample obtained prior to death was sent for targeted DNA mutation analysis. The study confirmed an ABCD1 variant previously reported in ALD.

Discussion: ALD, a rare, X-linked disorder, is characterized by elevated levels of very long chain fatty acids (VLCFA) in the brain and adrenal cortex. Males are more often and more severely affected than females. Accumulation of VLCFA results in loss of myelin and progressive dysfunction of the adrenal gland. Primary adrenal insufficiency (AI) may manifest as nausea, vomiting, hyperkalemia, hyponatremia, and episodes of dehydration. AI can be the only symptom of ALD. ALD is typically debilitating or fatal within 2-5 years of onset. Other symptoms of ALD include deafness, blindness, muscle wasting, and dementia. As an X-linked disorder, establishing the correct diagnosis is critical for proper genetic counselling of potentially affected family members. Establishing the correct diagnosis can alleviate feelings of guilt and lack of closure often experienced by family members. Genetic testing avoids further misdiagnosis and allows discussions of treatment options of affected family members. In this case, the autopsy allowed family members to receive genetic testing. Autopsies are a source of clinically relevant information that help assess the accuracy of pre-mortem diagnosis. Nationally autopsy rates have been declining. The cause of decline is multifactorial, with age and cause of death being significant, although approximately one-third of autopsies lead to a new diagnosis. An informative autopsy can help determine the test most likely to provide a correct diagnosis, utilizing limited samples obtained prior to or shortly after death. This approach often avoids unnecessary testing and expense. Barriers to autopsy include physicians' reluctance to request an autopsy and lack of information provided to family members.

Conclusions: This case illustrates the important role of autopsy in helping direct additional postmortem testing to confirm the cause of death. A protocol utilizing autopsy data to help inform perimortem genetic testing can help avoid the consequences of an undiagnosed genetic disorder. Physicians should

consider the use of autopsy in helping to determine an accurate cause of death, provide closure, and, as in this case, facilitate genetic counselling of family members.

Sponsor: N/A **IRB/IACUC#:** CCHCS IRB

509 - Poster **Classification:** TCOM DO Student
Presenter: Travis Schaefer **Department:** Orthopaedic Surgery
Authors: Travis Schaefer, UNT Health Science Center; Joshua Payne, JPS Health Network; Brian Webb, UNT Health Science Center

Reduction Technique in a Rockwood Grade VI Acromioclavicular Separation

Hypothesis and Purpose: Rockwood Grade VI acromioclavicular separations (AC) are extremely rare injuries and pose a challenge because the surgeon must reduce the clavicle to its appropriate anatomical position from the subcoracoid or subacromial space. After searching the literature, there is scant information of the appropriate reduction technique. This report aims to describe the reduction technique as well as the appropriate ligament reconstruction technique.

Materials and Methods: A 35 year old female was involved in a rollover motor vehicle crash with ejection. The patient presented to the ED with multiple facial lacerations, closed nasal fracture, a closed displaced left scapula fracture, a closed right ulna fracture, and a Rockwood Grade VI AC separation. She presented with severe left shoulder pain as well as numbness over the medial aspect of her forearm. We present our case of distal clavicle excision, reduction, and reconstruction of the coracoclavicular ligaments.

Results: The reduction was performed by placing a lobster claw clamp around the clavicular shaft to control the clavicle. A cobb elevator was used in a lever-like fashion to free the clavicle from the inferior coracoid. Soft tissue adhesion from the pectoralis minor and the anterior deltoid insertion were free with bovie electrocautery. A curette was used to sweep the pectoralis minor and the conjoined tendon off the clavicle as well as to cup the posterior inferior edge of the clavicle. Anterior and superior force was exerted on the clavicle until the clavicle was reduced into anatomic position. The distal clavicle was excised and the coracoclavicular ligament was reconstructed with a semitendinosis allograft. The patient's pain was improved post-operatively compared to pre-operatively and her pre-operative numbness was immediately resolved post-operatively.

Conclusions: Rockwood grade VI AC separation is a rare injury without a clear reduction technique. We present a reduction and fixation technique that was successful in improving our patients pain and her pre-operative numbness.

Sponsor: N/A
IRB/IACUC#: 2017-032

510 - Poster **Classification:** TCOM DO Student

Presenter: Julia Claire Vickery **Department:** Texas College of Osteopathic Medicine
Authors: Julia Vickery, UNT Health Science Center; Paul Bowman, UNT Health Science Center, Cook Children's Medical Center

Childhood Acute Leukemia with Unfavorable Cytogenetics: A Case of Monosomy 7

Purpose: Though not as common as acute lymphoblastic leukemia (ALL), acute myeloid leukemia (AML) represents a significant malignancy burden in pediatric populations. Survival rates are climbing as research improves our understanding of the disease process, but survival in AML remains below that of other childhood cancers. The purpose of this study was to examine a case of AML with unfavorable cytogenetics in the leukemia cells (monosomy 7) and observe the barriers to success in a high-risk patient.

Methods: A recently diagnosed, 6-year old Hispanic male patient at Cook Children's Medical Center was chosen for study because of his high-risk status due to monosomy 7 and challenging course of treatment and management. Medical records were reviewed for the entire course of his treatment, from diagnosis to eventual death. As the records were reviewed, special attention was paid to disease progression, resolution (or lack thereof) of risk factors, and development of treatment-related complications.

Results: During the course of his treatment, the patient was diagnosed with monosomy 7-positive AML with central nervous system (CNS) infiltration. He endured two courses of intensive induction chemotherapy and underwent two unrelated cord blood stem cell transplants. Both transplants ultimately resulted in primary engraftment failure, and the second was followed by clinical deterioration and death. During the course of therapy, the patient suffered from severe treatment-related immunosuppression that enhanced his risk for a variety of infectious complications. Despite aggressive interventions by the medical team including 82 days in the intensive care unit, the patient's status declined to irreversible multi-organ failure leading to the implementation of a palliative approach and the parents' decision to withdraw aggressive life support. The patient died from complications of persistent bone marrow failure having failed to achieve hematopoietic recovery despite two stem cell transplants.

Conclusions: Unfortunately, failure of treatment is not uncommon in patients with high-risk AML. The combination of monosomy 7 and CNS leukemia infiltration provided a poor prognosis at the time of diagnosis, and the patient was unable to overcome the complications of his disease and aggressive treatment course. New approaches to therapy based upon molecular targets and/or immune-based strategies are needed to offer a better prospect of survival for patients with high risk AML.

Sponsor: Cook Children's Research Hospital - Pediatric Summer Research Program
IRB/IACUC#: CCHCS IRB

511 - Poster **Classification:** TCOM DO Student

Presenter: Jenna Walls **Department:** Texas College of Osteopathic Medicine

Authors: Jenna Walls, UNT Health Science Center; Alejandro De La Torre, Cook Children's Medical Center; Luke Hamilton MS, Cook Children's Medical Center; Tyler Hamby PhD, Cook Children's Medical Center; Don Wilson MD, Cook Children's Medical Center

Thyrotoxicosis Presenting as Hypokalemic, Periodic Paralysis in a Previously Healthy 14-year-old Male

Introduction: Hypokalemic periodic paralysis (HPP) is an unusual manifestation of hyperthyroidism. It is the most common cause of acquired HPP, and more common in males of Asian descent. For patients with HPP, it is also important to identify the underlying etiology to prevent recurring episodes of potentially life-threatening paralysis.

Case Presentation: A previously healthy 14-year-old male was brought to the Emergency Department with acute, motor paralysis of both lower extremities. On physical examination, he was able to move all extremities but had a persistent, generalized weakness. The deep tendon reflexes were normal, and cranial nerves and sensation were intact. Vitals were within reference range except for elevated respiratory rate. In the Emergency Department, his potassium was noted to be very low at 1.5 mmol/L (ref: 3.5-5.0 mmol/L). BUN, creatinine, bilirubin, alkaline phosphatase, sodium, and chloride were all within normal range. A thyroid panel revealed a TSH of <0.01 uIU/ml (ref: 0.32-5 uIU/ml), free T4 elevated at 4.74 ng/dL, total T3 elevated at 321 ng/dL, and TSI and antibodies against thyroglobulin and TSH receptor were both present. These values indicate that the patient had hyperthyroidism from an autoimmune disorder (graves disease) which is most likely the cause of his HPP. He was treated surgically with a thyroidectomy and subsequent thyroid hormone replacement. His symptoms did not recur.

Discussion: HPP requires prompt treatment, since deaths from respiratory failure and arrhythmia have been reported[1]. The differential diagnoses of HPP have been discussed in other publications. The link between HPP and thyrotoxicosis is reported to be an increased β_2-adrenergic stimulation resulting from the elevated levels of thyroid hormone. This leads to cellular potassium uptake in muscle, disrupting the polarity of the membrane and causing problems with proper muscle cell stimulation. Once the thyroid hormone levels are normalized, the hypokalemia should cease and episodes of paralysis averted. The condition, when present, often manifests prior to other more common symptoms such of thyrotoxicosis.

Conclusions: Our case illustrates an unusual, but potentially life-threatening manifestation of thyrotoxicosis. Proper diagnosis is critical to successful long-term management. It is important to measure thyroid function studies (thyroid stimulating hormone and free T4) in all patients who present with unexplained periodic paralysis to avoid misdiagnosis.

Sponsor: N/A
IRB/IACUC#: CCHCS IRB

512 - Poster **Classification:** TCOM DO Student

Presenter: Matthew Wise **Department:** Texas College of Osteopathic Medicine

Authors: Matthew Wise, UNT Health Science Center; Riyaz Basha, PhD, UNT Health Science Center; Sandy Cope-Yokoyama MD, Cook Children's Medical Center; Paul Bowman MD, UNT Health Science Center

Ewing Sarcoma in a Young Adult: Survival Following Disease Recurrence

Background: Ewing sarcoma is a rare, malignant cancer of bone and soft tissue that primarily affects adolescents and young adults. It is generally considered a treatable cancer. Nevertheless, when patients defy traditional survival indicators, namely age at diagnosis, relapse occurrence, and disease-free interval, their management, especially prognostically, is all the more challenging.

Case Presentation: A 28-year-old Caucasian male presented to his physician with complaints of intermittent, severe chest pain and fever over 14 months. A right intrathoracic soft tissue mass was found on computed tomography (CT scan), and biopsy identified a small round blue cell tumor. The patient sought a 2nd opinion at Cook Children's Medical Center, where bone scan and pathology confirmed an invasive Ewing sarcoma of the 5th rib. Ninety-five percent of cases with this diagnosis are made in patients who are between the ages of 4 and 25 years old. One week later, he began intensive chemotherapy at 2 week intervals (interval compression protocol) of 14 cycles, alternating Vincristine, Doxorubicin, and Cyclophosphamide with Ifosfamide and Etoposide. Ribs 4-6 were resected after completion of the 6th cycle, and tumor showed greater than 90% necrosis, indicating a dramatic response to chemotherapy. Following surgery, the patient completed 8 more cycles with excellent response and minimal complications. However, the patient presented again with recurrent chest pain 24 months later. Magnetic Resonance Imaging (MRI) and tissue biopsy confirmed tumor relapse along the 5th rib. Immediately, he began 12 cycles of Irinotecan & Temozolomide on an interval compression schedule. The tumor was successfully resected after the 4th cycle, and radiation to the site was added during the 9th and 10th cycles. Since his recurrence, the patient has shown no signs of relapse or metastasis during a follow-up period of 4 years and 10 months. This favorable outcome contrasts with the less than 20% survival rate anticipated in local recurrences between 1-2 years after complete remission.

Conclusions: This case is unique in that the patient presented outside the expected age range, was diagnosed more than a year after the onset of symptoms, and relapsed within two years of complete remission. Yet, he survives several years later, free of disease and with minimal complications. This case challenges the current understanding of prognostic factors in Ewing sarcoma while emphasizing their influence in the proper care and management of patients.

Sponsor: N/A
IRB/IACUC#: CCHCS IR

Cell Biology (Abstracts in the 600s)

600 - Poster **Classification:** GSBS Student
Presenter: Venkata Viswanadh Edara **Department:** Institute for Molecular Medicine
Authors: Venkata Viswanadh Edara, UNT Health Science Center; Anuja Ghorpade, UNT Health Science Center

Red/Green Astrocytes Mimic CNS Viral Reservoirs in Post ART HAND: Implications for Meth Abuse

Hypothesis: Though anti-retroviral therapy (ART) has increased the life expectancy of HIV-1 infected individuals, the quest for eradication of latent viral reservoirs continues. Methamphetamine (Meth) abuse and HIV-1 infection increase neuroinflammation through cellular and molecular mechanisms such as gliosis, viral replication, oxidative stress, and excitotoxicity. Multiple studies have validated astrocytes as a major reservoir of HIV-1 in the CNS. We hypothesized that astrocyte HIV-1 reservoirs contribute to HIV-associated neurocognitive disorders (HAND) pathogenesis, and are mediated by Meth abuse during HIV-1 infection.

Materials and Methods: A doubly labeled fluorescent reporter Red/Green-HIV-1 (R/G-HIV-1) was used to model latency in primary human astrocytes. Active (mCherry+/GFP+) and latently infected (mCherry+/GFP-) astrocytes were enriched using fluorescence activated cell sorting.

Results: Pseudotyped R/G-HIV-1-infected astrocytes established latency over a period of 21 days. These studies were also conducted with pre- and/or post-Meth treatment. Latently-infected astrocytes were devoid of late viral proteins such as p24, indicating a functionally silent HIV-1 LTR. Vorinostat, an HDAC inhibitor, reactivated the silenced HIV-1 LTR in a mixed population of pseudotyped R/G-HIV-1-infected astrocytes.

Conclusions: Our data suggests R/G-HIV-1 could be used as a relevant model of latency in astrocytes since it mimics virus reactivation in inflammation leading to viral proteins expression. We anticipate that healthy versus latently infected astrocytes respond differentially to inflammation. Investigating the underlying mechanisms will help in assessing the role of HIV-1 astrocyte reservoirs in HAND pathogenesis.

Sponsor: N/A
IRB/IACUC#: 2007-121

601 - Poster **Classification:** GSBS Student

Presenter: Shruthi Nooka **Department:** Institute for Molecular Medicine
Authors: Shruthi Nooka, UNT Health Science Center; Anuja Ghorpade, UNT Health Science Center

Interleukin-1β and Abacavir Induce Astrocyte Endoplasmic Reticulum Stress During HIV-1-Associated Neurocognitive Disorders

Purpose: Globally 69% of HIV-1-positive individuals suffer from HIV-1-associated neurocognitive disorders (HAND) despite effective anti-retroviral therapy (ART). Persistent glial-mediated inflammation, BBB disruption, increased oxidative stress, and viral protein expression together lead to HIV-1 disease progression. ARV drugs, while successfully controlling viral load, likely induce cellular stress responses, oxidative stress, inflammation, and mitochondrial damage. Recently, endoplasmic reticulum (ER) stress has been linked to many neurological diseases, including HAND. Astrocyte elevated gene (AEG)-1, a HIV-1 inducible gene, upregulation in Huntington's disease model along with ER stress markers, recommends its possible role in HIV-1/ART triggered ER stress. We hypothesize that HAND-relevant inflammatory stimuli and ARV drugs induce astrocyte ER stress and AEG-1 expression that further mediates cellular stress responses in post-ART HAND.

Materials and Methods: Cultured human astrocytes were treated with HIV-1_{DJV}, interleukin (IL)-1β and ARV drugs. Astrocytes were transfected with GCaMP6s plasmid. ER stress markers gene expression and protein levels were determined by RT-PCR, western blot analysis and immunocytochemistry. Confocal imaging and mPTP assay was also performed.

Results: HIV-1, IL-1β and ARV drugs abacavir and lamivudine, upregulated ER stress markers, and activated unfolded protein response (UPR) pathways i.e., PERK, ATF6, and IRE1α in astrocytes. IL-1β and abacavir treated astrocytes indicated phosphorylation of eIF2α. ARV drugs and ER stress compounds induced astrocyte AEG-1 levels that correlated to PERK and BiP expression. Intracellular calcium signaling changes in response to IL-1β and abacavir were observed in astrocytes transfected with a genetically encoded calcium indicator, GCaMP6s. IL-1β and abacavir also increased calnexin levels in astrocytes. Further, confocal analysis and mPTP assay showed AEG-1 colocalization with calnexin and mitochondrial damage with ER stress.

Conclusions: In summary, our study highlights that ARV drugs and IL-1β induced AEG-1 expression, ER stress, cellular calcium overload, and mitochondrial damage in astrocytes. Therefore, identifying novel mechanisms mediated by astrocytes via ER stress and UPR signaling may have broader implications in neuroAIDS management.

Sponsor: N/A
IRB/IACUC#: 2007-121

604 - Poster **Classification:** GSBS Student

Presenter: Chaitanya R. Joshi **Department:** Institute for Molecular Medicine
Authors: Chaitanya Joshi, UNT Health Science Center; Vinod Labhasetwar, Cleveland Clinic Lerner Research Institute; Anuja Ghorpade, UNT Health Science Center

Polymeric Nanoparticle-Mediated Gene Delivery to Human Astrocytes

Purpose: Astrocyte tissue-inhibitor of metalloproteinases-1 (TIMP-1) protects neurons during HIV-1-induced apoptosis. However, TIMP-1 levels decrease during chronic inflammation typical of HIV-associated neurocognitive disorders (HAND). We propose that astrocyte-targeted TIMP-1-gene delivery could be a suitable therapeutic for HAND. Nanoparticle (NP)-mediated gene delivery is a viable approach since genes can be delivered to specific brain cell types and NPs are less immunogenic than viral vectors. To test this hypothesis, obtaining a safe and effective gene delivery system is essential.

Methods: We tested the gene delivery potential of arginine-based polyethylenimine (PEI) analogs (AnPn) and poly-lactic-co-glycolic-acid (PLGA) in vitro (primary human cells) and in vivo (mice) using a luciferase-reporter plasmid (pLuc). Immunocytochemisty and immunohistochemistry were carried out using antibodies specific to glial fibrillary acidic protein (GFAP), microtubule-associated protein 2 (MAP2), and luciferase.

Results: PLGA NPs delivered pLuc across astrocyte plasma membrane but failed to induce protein expression. In parallel, A5P50, a PEI analog, efficiently expressed pLuc in astrocytes. Yet, its neuronal biocompatibility was not optimal. Combining low doses of AnPn with pLuc-loaded-PLGA NPs lead to high gene expression in all cell types including astrocytes. Live imaging indicated that AnPn facilitated PLGA-released-pLuc delivery across the nuclear membrane by an unknown mechanism. Consequently, optimally biocompatible PEI analogs were also synthesized and tested.

Conclusions: Our data indicate that AnPn-PLGA combination and new AnPn analogs overcome both neuronal biocompatibility and astrocyte-specific gene expression issues promising clinical translations for HAND treatment in future.

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IRB/IACUC#: 2007-121; 2013-14-26-A04

Community Medicine (Abstracts in the 700s)

700 - Poster **Classification:** Resident
Presenter: Dr. Trevor K. Huber DO **Department:** Family Medicine
Authors: Trevor Huber, UNT Health Science Center; Susan Franks, UNT Health Science Center; Michael Shaffer DO, UNT Health Science Center

Active and Sedentary Activities As Potential Determinants of Intrinsic Motivation for Child Physical Activity

Background: Physical inactivity among children in the United States has increased over the last 1-2 decades. Simultaneous to this trend have been increases in sedentary activity and a growing childhood obesity epidemic. This study aimed to evaluate several active and sedentary activities as potential determinants of intrinsic motivation to engage in physical activity (IMPA) among underserved African American and Hispanic youth.

Hypothesis: We hypothesize that youth with higher levels of physical activity or lower levels of screen time will report higher levels of IMPA.

Methods: This is a secondary analysis of self-report data from an after school obesity prevention program for underserved youth in Fort Worth, Texas. There were 117 children (48.7% male) with an average age of 9.2 years (sd=1.08). Independent variables included number of sports played in past year, frequency of physical education classes per week, number of days of at least 1-hour of physical activity in past week, hours of television (TV) watching per school day, and hours of video/computer play per school day. Each variable was categorized into high or low activity based on accepted clinical guidelines. Where guidelines were not available, decisions were made based on exploration of the data. For each independent variable, Mann-Whitney U was used to determine differences between IMPA for high and low activity. Chi-square was used to determine race/ethnicity and weight class differences between each variable showing significant differences in IMPA.

Results: IMPA was significantly higher for youth playing three or more sports in the last year versus none (p=.041), and for youth watching one or fewer hours of TV per school day versus 2 or more hours (p=.016). No other variables showed significant differences in IMPA. Levels of sports participation and TV watching did not differ by race/ethnicity or weight classification.

Conclusions: When counseling parents on increasing physical activity of their children, year-round sports participation and reduced TV watching during school days should be highly encouraged. Parents should also be educated regarding the importance of helping their child develop intrinsic motivation for being physically active and how this can relate to overall health and obesity risk reduction.

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Sponsor: Coca-cola Foundation and UNTHSC foundation
IRB/IACUC#: 2011-003 and 2012-213 n/a

701 - Poster **Classification:** TCOM DO Student
Presenter: Rachel Larrabee **Department:** Geriatrics
Authors: Rachel Larrabee, UNT Health Science Center; Janice Knebl, UNT Health Science Center; John Allen, UNT Health Science Center

Preventing 30 Day Hospital Readmissions Through Predictor Identification

Introduction: Safe Transitions for Elderly Patients (STEP) is an in-home transitional care service for Medicaid eligible adults aged 50 and older with the goal of ameliorating the CMMS national average rate 21.6% (2013) of patients' readmission to the hospital within 30 days of discharge. The purpose of the project is to identify potential modifiable clinical and non-clinical factors that will improve patient safety and reduce rehospitalization rates for this vulnerable population.

Methods: The study design is a retrospective cohort study of data collected from 498 patients age 50 and older that were enrolled in the STEP program. Exclusion criteria from the original data includes all patients without a BMI assessment, a risk stratification, a transportation assessment, a living assessment, and anyone who was not asked about their primary care provider (PCP). The remaining data was analyzed with respect to readmission status, medical conditions, and risk stratification classification. Comparisons were analyzed using SPSS statistical software including chi-square testing and odds ratio analysis.

Results: The readmission rate for the patients included in this study 19.5%. The odds ratio revealed that age greater than 65 (2.02, 95% CI 1.23-3.24), seven to eleven diagnoses at readmission (1.75, 95% CI 1.12-2.74), High Risk Stratification (2.81, 95% CI 1.70-4.63), CHF (2.00, 95% CI 1.22-3.28), and COPD (1.74, 95% CI 1.08-2.79) were each individually associated with higher odds of readmission within 30 days. Living alone was associated with lower rate of readmission within 30 days (0.53, 95% CI 0.30-0.93). Data collected that that proved to be statistically not significant included pain scale rating greater than 6, not having a primary care provider, limited transportation, diabetes mellitus type 2, obesity, and hypertension.

Conclusions: The individual factors—age greater than 65, High Risk Stratification, CHF, and COPD—are significant predictors of readmission within 30 days post discharge within this population. Knowing about these factors will help design transition of care programs that target this high-risk population.

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702 - Poster **Classification:** TCOM DO Student

Presenter: Carter M. Newey **Department:** Texas College of Osteopathic Medicine
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An Overview of Rehabilitation Services Offered in the North Texas Area

Objective: Rehabilitation medicine is concerned with improving function through the diagnosis and treatment of health conditions, reduction of impairments, and prevention of complications. The health conditions treated by a rehabilitation team span from traumatic brain injury to gait disorders. This unique field relies heavily on the coordination of a multifaceted team of physicians, therapists, social workers, nurses, dieticians and many more. New advances of the technology in areas such as pharmacologic therapy, prosthetics and other mobility assistance devices are the cutting edge of this dynamic field. With its emphasis on improving the quality of life, rehabilitation services are a vital part of providing the best possible patient centered health care. The purpose of this study was to investigate the rehabilitative services available to the residents of the North Texas area and provide a useful summary of each program for the benefit of healthcare providers who might seek this assistance for their patients.

Methods: This poster utilized and summarized the resources available on each the five participating program's websites.

Results: The Texas Department of Assistive and Rehabilitative Services Vocational Rehabilitation Program helps individuals who have physical or mental disabilities to find employment. Helping Restore Ability provides a means for individuals who have disabilities to stay in their own homes, rather than having to relocate to a hospital or skilled nursing facility. Texas Technology Access Program helps individuals gain access to assistance devices and equipment to enhance their function and independence. Comprehensive Rehabilitation Services helps individuals with traumatic brain injuries or spinal cord injuries to receive the required care that they need. REACH Resource Centers on Independent Living aids individuals as they strive to lead independent lives.

Conclusions: North Texas offers a variety of options to individuals who are in need of rehabilitative services. Ultimately, the goal of each program is to enhance an individual's functional ability and independence by providing each person with the tools, guidance, and opportunities they need in order to live more fulfilling lives.

Sponsor: N/A
IRB/IACUC#: N/A

703 - Poster **Classification:** TCOM DO Student

Presenter: Kaitlin Phillips **Department:** Texas College of Osteopathic Medicine

Authors: Kaitlin Phillips , OMS-I, UNT Health Science Center; Michael Alavi OMS-I, UNT Health Science Center; Lauren Burgess OMS-I, UNT Health Science Center; Kathryn J. Dolan Ph.D., UNT Health Science Center

Current Endeavors to Support the Homeless Population of Fort Worth

Purpose: The aim of this research was to identify and explore current solutions in supporting the homeless population in Fort Worth, Texas, particularly through the services provided by local non-profit organizations.

Methods: We identified the terms of eligibility, services provided, service access, and barriers to effective outreach provided by five local non-profit organizations, including John Peter Smith Health Network, Tarrant County Samaritan Housing, Arlington Life Shelter, Salvation Army DFW, and Union Gospel Mission of Tarrant County.

Results/Conclusions: Frequent terms of eligibility include valid U.S. identification and proof of low-income or homeless status, and common service access methods include hospital referrals, word of mouth, and flyers in well-populated public areas. Services provided included shelter, aid in employment search, navigation to health services, and a variety of supportive services to integrate those who have been recently homeless into society. These organizations have encountered multiple barriers to effective outreach, such as client mental illness, client lack of appropriate paperwork, shortage of affordable housing, and transportation difficulties. Non-profit organizations in Fort Worth provide varying degrees of support for the homeless population and have identified areas for improvement that that citizens, volunteers, local government, and the organizations themselves can consider in broadening their outreach.

Sponsor: N/A
IRB/IACUC#: N/A

704 - Poster **Classification:** TCOM DO Student

Presenter: Rachel Urbanczyk **Department:** Rural Medicine

Authors: Rachel Urbanczyk, UNT Health Science Center; Roberto Sanchez, UNT Health Science Center; Stacy Abraham, UNT Health Science Center; Md Abdullah A. Mamun, UNT Health Science Center; John Gibson Dr., UNT Health Science Center

An Evaluation of Socioeconomic Factors and Health Status on Health-Related Quality Of Life (HRQoL) in Rural Texas

Purpose: HRQoL allows us to focus on how the individual perceives his or her own impairments of health. HRQoL in rural areas is rarely examined, yet its measurements can help identify significant health disparity issues and community burdens that will further highlight the needs in communities. We hypothesized that demographic factors and mental illness would have a significant impact on HRQoL in rural Texas communities.

Methods: A cross-sectional survey in the form of a questionnaire was completed by 191 patients in 2 different rural Texas communities. Survey questions were taken from the CDC Health Related Quality of Life-14 “Healthy Days Measure” system and from the Behavioral Risk Factor Surveillance System questionnaire. Relationship of socioeconomic factors and health status with HRQoL were assessed using univariate and multiple variable analysis. Wilcoxon signed rank test was used to examine the mean number of unhealthy days in Texas versus the two rural communities in the study.

Results: After adjusting for age and gender, we found that on average Hispanics reported a significantly less number of physical or mental unhealthy days in comparison to Whites (p-value = 0.0167). We also found that people with high income reported significantly less number of physical and mental unhealthy days on average (p-value for < $30,000 to 30,000-40,000 is <0.0001 and for <$30,000 to $50,000 or more is 0.0025). However, age, gender, education, and smoking status are not significantly associated with number of unhealthy days. We found that persons suffering from mental illness (dementia or depression) reported significantly higher number of physical or mental unhealthy days on average. Though our study area has higher mean unhealthy days, it is not significantly different from the Texas mean (Wilcoxon signed ranked test, p-value =0.4547).

Conclusions: The results suggest that HRQoL can be influenced by many factors, including income level, race, and location. Our results identified that mental health factors are an important component affecting HRQoL and should be studied further in rural Texas communities. Focus on mental health programs and economic development could be beneficial for these communities.

Sponsor: N/A
IRB/IACUC#: 2016-064

705 - Poster **Classification:** TCOM DO Student

Presenter: Matthew Vandermause **Department:** Texas College of Osteopathic Medicine

Authors: Matthew Vandermause, UNT Health Science Center; Ryan Corjay, UNT Health Science Center; Jason Gnasigamany, UNT Health Science Center; Brandon Griffin, UNT Health Science Center; Stephanie Luu, UNT Health Science Center; Kathy Dolan, UNT Health Science Center

JPS Community Clinics

Objective: Approximately 41 million Americans are thought to be living in poverty which includes 21% of all children and 12% of adults and translates into 291,534 individuals in Tarrant County. Low-income individuals often lack access to the most basic primary health care services, including women's health, pediatric services, and basic dental care. This project was undertaken to identify the safety net of community-based healthcare for people living in poverty in Tarrant County.

Materials and Methods: The following JPS community clinic resources were identified using TarrantCares.org, Tarrant County 211 websites, the JPS website, and visits to the JPS main hospital and Viola Pitts/Como Community Health Center.

Results: This led us to identify the most significant nonprofit primary health care resources provided by the Tarrant County Hospital District, JPS Health Network, which includes comprehensive community health clinics as well as school-based clinics. Careful consideration of the community clinic capacities, eligibility requirements, and overall barriers to care experienced by individuals suggests the JPS community clinics are providing a much-needed healthcare service in Tarrant County. JPS continuously adapts to the changing needs of the underserved community by delivering culturally competent care to very diverse patient populations and by implementing the community needs assessment and improvement plan. Additionally, JPS trains its workforce to deliver patient education for self-management of chronic conditions such as hypertension and diabetes.

Conclusions: JPS Health Network provides broad medical coverage for persons in poverty and for persons without adequate access to health care in Tarrant County through the JPS community clinics. Room for improvement in health coverage was identified as the need for increased access to care for persons with behavioral health issues, the need for expansion of school-based clinics, new and improved modalities for patient education, and further reduction of preventable ED visits.

Sponsor: N/A
IRB/IACUC#: N/A

Diabetes (Abstracts in the 800s)

800 - Poster **Classification:** SPH Student
Presenter: Amruta Barve **Department:** Behavioral & Community Health
Authors: Amruta Barve, UNT Health Science Center; Taksh Shah, UNT Health Science Center; Samyuktha Kolluru, UNT Health Science Center; Alisa Rich, UNT Health Science Center

Acanthosis Nigricans - A Reliable Diagnostic Indicator of Insulin Resistance and Type 2 Diabetes Mellitus in Obese Youth And Adolescents

Background: Over the last few decades, there has been an increasing prevalence of Type 2 diabetes mellitus (DM) in youth with obesity. Acanthosis Nigricans (AN) is frequently associated with obesity and is a reliable risk indicator for developing type 2 diabetes. Although the risk for obesity is elevated in African American populations in general, there is a 2-fold increased risk in African Americans having AN to develop non-insulin dependent diabetes mellitus (NIDDM). AN once considered a rare dermatological condition is now frequently observed among obese youths and adolescents across ethnicities.

Objective: The aim of this study is to evaluate AN as a diagnostic indicator; and its correlation to insulin resistance, obesity, and increased risk for development of diabetes in obese youth and adolescents.

Methods: A systematic review of databases (Pubmed, Scopus, and Medline) resulted in 1743 publications related to AN, and Type 2 DM. Cross referencing AN, and Type 2 DM with obesity resulted in 679 publications since 2000. Search was narrowed using keywords AN, type 2 DM, insulin resistance, obesity, risk, youth and screening which resulted in 27 referenced papers. Abstracts of the papers were retrieved and reviewed for relevance resulting in 22 papers retrieved in full and evaluated. Studies, where AN presents with drug induced, autoimmune (systemic lupus erythematosus) or syndromic (hyperandrogenism) conditions, were excluded.

Results: Results of the study confirm AN is associated with insulin resistance in obese youth and adolescents. Reports indicate a strong association of AN with insulin resistance, hyperinsulinemia, and risk for developing diabetes. Hyperpigmentation of the skin in AN is generally symmetrically distributed in the neck area, but can also be present in the forehead and folds of the skin (groin, armpits, and bends of the arms and knees). Research confirmed a positive and independent association between ethnicity, family history of diabetes, high body mass index (BMI), obesity, hyperinsulinemia, insulin resistance and AN.

Conclusions: AN is strongly associated with obesity, hyperinsulinemia, insulin resistance and type 2 DM, which can be used as a reliable index for insulin resistance and to identify diabetes risk. It provides a valuable tool to primary care providers for prediabetes identification and secondary prevention. Screening programs for AN can be conducted in schools to identify children at the highest risk of developing type 2 DM associated with obesity. Intervention programs should incorporate AN screening, an easily performed and noninvasive technique along with other important risk factors for identifying obese adolescents at risk for type 2 diabetes. Adopting lifestyle changes along with early detection of AN and other risk markers may reduce the prevalence, incidence, and burden of type 2 DM in obese youth and adolescents.

Sponsor: N/A **IRB/IACUC#:** N/A

801 - Poster **Classification:** TCOM DO Student

Presenter: Amritpaul Chatrath **Department:** Pediatrics

Authors: Amritpaul Chatrath, UNT Health Science Center; Nusrath Habiba, UNT Health Science Center; Tyler Hamby, UNT Health Science Center; Riyaz Basha Dr., UNT Health Science Center; Deep Shah, UNT Health Science Center; Paul Bowman MD, UNT Health Science Center

Association of Elevated Liver Enzymes with Non-Invasive Risk Factors for Type II Diabetes Mellitus in Children

Purpose: The obesity epidemic has led to an increased incidence of type 2 diabetes mellitus (T2DM) and non-alcoholic fatty liver disease (NAFLD) in children. This relationship is significant as the liver is intimately involved in blood glucose homeostasis as insulin resistance triggers glycogenolysis in the liver. However, there is limited research on the association between elevated liver enzymes and risk factors for T2DM in children.

The purpose of this study was to assess the prevalence of elevated liver enzymes and their association with non-invasive risk factors for T2DM in non-diabetic children between the ages of 10-14 years without chronic diseases. The liver enzymes studied were alkaline phosphatase (ALP), alanine aminotransferase (ALT), and gamma-glutamyl transpeptidase (GGT). The non-invasive risk factors for T2DM are 1) Body Mass Index (BMI) > 85th percentile for age and gender, 2) blood pressure > 95th percentile for height and gender, 3) acanthosis nigricans, 4) race or ethnicity of high risk, and 5) history of T2DM in the family. A race or ethnicity of high risk includes African Americans, Hispanics, American Indians, and Asian/Pacific Islanders.

Methods: Following IRB approval, the study was conducted at the outpatient clinics of the University of North Texas Health Science Center, Fort Worth. Children with elevated blood glucose levels, chronic medical conditions, or those who had received systemic corticosteroid therapy within the last year were excluded. Participation was voluntary and 151 children participated in the study who were from the representative races and ethnicities attending the clinics.

Results: Results indicated that those with elevated GGT levels had marginally higher BMI ($p=0.06$) and were significantly more likely to have acanthosis nigricans ($p<0.01$). In males, but not females, the relationships between GGT and both BMI ($p<0.05$) and acanthosis nigricans ($p<0.01$) were evident. In regards to race, African Americans generally possessed elevated GGT levels ($p=0.02$). Regardless of race, females were more likely to have an elevated ALP level ($p=0.03$), and there was a statistically significant relationship between family history of T2DM and elevated ALP ($p<0.05$) in females as well.

Conclusions: These results suggest that there are meaningful relationships between elevated liver enzymes and non-invasive risk factors for T2DM.

Sponsor: N/A
IRB/IACUC#: 2011-136

802 - Poster **Classification:** School of Health Professions Student

Presenter: Madison F. Hamilton **Department:** Physician Assistant Studies

Authors: Madison Hamilton PA-S, UNT Health Science Center; Christine Smith PA-S, UNT Health Science Center; Danielle Salo PA-S, UNT Health Science Center; Morgan Gamble PA-S, UNT Health Science Center; Hartos Jessica PhD, UNT Health Science Center

Is Diabetes a Risk Factor for Blindness in Males 35 and Older?

Introduction: The incidence of blindness has reached an all time high and is expected to increase exponentially within the next forty years (1). Previous studies have found that diabetes is the most common cause of blindness in working age adults (2). However, blindness due to diabetes has also shown a multi-peak age distribution, peaking in young adults and over 60 years old. The purpose of this study was to assess whether diabetes is a risk factor for blindness in males 35 and older.

Methods: BRFSS data from 2014 was used for men 35 and older from New Mexico, Kentucky, Montana and Mississippi in this cross-sectional analysis. Multiple logistic regression analysis was performed to assess the relationship between diabetes and blindness, while controlling for weight status, education level, health care access, lifetime diagnosis of stroke, chronic health problems and ethnicity/ race.

Results: A low percentage of males age 35 and older reported blindness (5-10%) or diabetes (11-18%). In multiple logistic regression analysis, blindness was significantly related to diabetes in Kentucky, New Mexico and Montana (moderate to large effect sizes) and significantly related to chronic health problems in all four states (large effect sizes).

Conclusions: Although this study was unable to determine temporal relations, we found that blindness was related to diabetes and chronic health problems in general population samples of males 35 and older. Even though diabetes and blindness may have a low prevalence in primary care, providers should expect them to be related and should screen for both if male patients 35 and older present with symptoms of either, which is common practice. Chronic health problems (52-65%) are more prevalent than blindness and diabetes in males 35 and older, and if present, patients should be screened for vision loss.

Sponsor: N/A
IRB/IACUC#: 2016-074

803 - Poster **Classification:** TCOM DO Student

Presenter: Todd Jarvis **Department:** Pediatrics

Authors: Luke Hamilton M.S., Cook Children's Medical Center; Todd Jarvis M.S., UNT Health Science Center; Paul Thornton M.D., Cook Children's Medical Center; Jose L. Gonzalez M.D., J.D., M.S.Ed., Cook Children's Medical Center; Susan Hsieh M.D., Cook Children's Medical Center; Don P. Wilson M.D., FNLA, Cook Children's Medical Center

Readmission Rates for Children with Diabetic Ketoacidosis (DKA)

Background: Ketoacidosis is a potentially life threatening complication of diabetes mellitus. Emergency Departments (ED) are usually the first point of contact. Criteria for admission varies and could influence the rate of readmissions.

Objective: To describe the population and compare readmission rates of patients treated at Cook Children's ED for DKA.

Methods: A retrospective chart review was preformed of children seen in the Cook Children's Medical Center ED from September 2011 – August 2014. No attempt was made to classify patients as T1 vs T2. APR-DRG 420 (diabetic ketoacidosis) was used for subject selection.

Results: 313 children were seen in the ED with a diagnosis of DKA. Of the total patients seen in the ED, 14% were discharged for home management after initial assessment and treatment; 86% were admitted to the hospital. Of the patients discharged, a median 5.2 hours was spent in the ED. Discharged patients had a median glucose of 285 mg/dL (nl. 74-120 mg/dL), median pH of 7.3 (nl. 7.35-7.45), and median HCO_3 of 20.4 mEq/L (nl. 22-28 mEq/L). Of the patients admitted, a median 3.6 hours was spent in the ED. Admitted patients had a median glucose of 437 mg/dL, median pH of 7.2, and median HCO_3 of 11.2 mEq/L.

Conclusions: DKA is defined as 1) metabolic acidosis (pH < 7.3; HCO_3 < 15 mEq/L); 2) hyperglycemia (serum glucose > 200 mg/dL); and 3) ketonemia/ketonuria. It occurs frequently among youth with diabetes and is the main cause of mortality in individuals with diabetes < 24 years of age. DKA is more common in those with T1D, but can also be seen in children with T2D. The metabolic changes in DKA usually occur rapidly and can be fatal, primarily due to cerebral edema.

Of the 313 children seen in the ED from September 2011 — August 2014, a large majority were admitted from the ED. Glucose levels of admitted patients (437 mg/dL) were 53% higher than discharged patients (285 mg/dL). Admitted patients HCO_3 levels (11.2 mEq/L) were 45% lower than discharged patients (20.4 mEq/L). Of the 45 discharged from the ED, 16% returned to the ED within 90 days for DKA, while only 7% of the 268 children admitted returned. In the US, DKA is present in up to 40% of youth with new-onset diabetes. A recent study found 1 in 5 children were re-admitted for DKA within 1 year of a previous occurrence, with large variations in treatment for DKA within Children's Hospitals located in the US. These studies illustrate the need to identify children who are at risk for DKA and to develop effective interventions for prevention of DKA. A better understanding of the characteristics of children with DKA and treatment/disposition strategies used by ED physicians can help improve care of those treated in the ED.

Sponsor: N/A

IRB/IACUC#: CCHCS IRB 2014-076

804 - Poster **Classification:** TCOM DO Student

Presenter: Clint Jones **Department:** Institute for Cardiovascular and Metabolic Disease

Authors: Clint Jones, UNT Health Science Center; Vipulkumar Patel, UNT Health Science Center, Texas Tech University Health Science Center El Paso; Ina Mishra, UNT Health Science Center, Texas Tech University Health Science Center El Paso; Sneha Deodhar, UNT Health Science Center; David Cistola, UNT Health Science Center, Texas Tech University Health Sciences Center El Paso

Use of Frozen vs. Fresh Plasma to Assess Early Insulin Resistance Syndrome

Background: Insulin resistance is defined as the blunted response to insulin by tissues and can progress to prediabetes and type 2 diabetes. About 86 million US adults were identified with pre-diabetes in 2012. By the time prediabetes develops, approximately 70% of β-cell secretory function has been lost irreversibly. Thus, it is imperative to detect insulin resistance at an earlier stage in order to preserve pancreatic function and prevent progression to diabetes. Prior work revealed that water proton transverse relaxation time (T_2) measured by NMR relaxometry using fresh human plasma samples provides a sensitive and specific biomarker for early insulin resistance syndrome.

Purpose: The objective of this study was to compare T_2 values of frozen plasma samples with those from fresh plasma to assess the feasibility of analyzing bio-banked samples from longitudinal population studies.

Hypothesis: Freezing at -80^{o}C will have little or no impact on measured T_2 values and their correlation with insulin resistance markers.

Methods: We recruited 45 asymptomatic, non-diabetic human volunteers though an IRB approved protocol. Blood samples were collected after an overnight fast and were processed and analyzed immediately, with the remaining samples stored at -80^{o}C. In addition, over 200 blood biomarkers were measured on each fresh blood sample – many by outside laboratories including Quest Diagnostics, Inc. and Atherotech, Inc. After several months in the freezer, the NMR measurements were performed on the once-frozen, once-thawed samples. All NMR measurements were performed at 37^{o}C using a Bruker mq20 Minispec instrument and a modified CPMG pulse scheme. The associations between frozen and fresh T_2 values and metabolic biomarkers were quantified using the Pearson's product moment and concordance correlation coefficients.

Results: Plasma water T_2 from frozen samples showed a strong, statistically significant correlation with fresh plasma water T_2 values (Pearson r=0.85, Concordance correlation coefficient=0.74). However, the frozen plasma water T_2 were 5% lower, on average, than fresh samples. Nevertheless, this difference did not impact the overall pattern of association between T_2 and metabolic biomarkers of early insulin resistance syndrome.

Conclusions: These findings establish the feasibility of using frozen bio-banked specimens for the validation of plasma water T_2 as a metabolic biomarker and screening tool for diabetes risk assessment.

Sponsor: Garvey Texas Foundation, Texas Tech University Health Sciences Center El Paso
IRB/IACUC#: 2013-205

805 - Poster **Classification:** GSBS Student

Presenter: Ina Mishra **Department:** Institute for Cardiovascular and Metabolic Disease
Authors: Ina Mishra, UNT Health Science Center; Sneha Deodhar, UNT Health Science Center; David Cistola, UNT Health Science Center, Texas Tech University Health Sciences Center El Paso

Unveiling the Factors Driving Plasma Water T2 as a Biomarker for Early Insulin Resistance Syndrome

Background: Approximately 86 million US adults have prediabetes, putting them at high risk for type 2 diabetes mellitus and cardiovascular disease. Prediabetes is a state of impaired glucose tolerance or moderate hyperglycemia where up to 70% of pancreatic β-cell capacity has been lost irreversibly. It is preceded by an often-undetected phase, early insulin resistance syndrome (EIRS), which consists of compensatory hyperinsulinemia, dyslipidemia, subclinical inflammation and electrolyte abnormalities. Early identification is important to preserve pancreatic function and prevent diabetes and pre-diabetes. In previous work, we showed that plasma water transverse relaxation time T_2, measured using benchtop NMR relaxometry, provides a sensitive measure of EIRS in asymptomatic, normoglycemic subjects. Plasma water T_2 detected EIRS in 15% of this cohort, which was undetected by fasting glucose or HbA_{1c}. Our hypothesis is that shifts in the levels of specific acute phase proteins and lipoproteins drive plasma water T_2 values lower in EIRS.

Purpose: To quantify the contributions from the most abundant plasma proteins and lipoproteins to plasma water T_2 by determining relaxivity values (r, slope of $1/T_2$ vs. concentration). Higher relaxivity means greater influence on water T_2.

Methods: Purified plasma protein fractions were obtain from Millipore-Sigma, Inc. and Athens, Inc., and lipoprotein fractions were prepared from human plasma using density-gradient ultracentrifugation. Two sets of serial dilutions were made for each protein and lipoprotein fraction: (1) in phosphate-buffered saline, to determine r value in buffer alone, and 2) in a mixture of human serum albumin and gamma globulin, to determine r in a background that mimics human plasma. Protein concentrations were quantified using a Pierce BCA assay, and total cholesterol and triglyceride concentrations, using kits from Wako Diagnostics. Linear regression was used to quantify and compare r values.

Results: The highest relaxivity values were observed for ceruloplasmin, haptoglobin, apo-transferrin and complement C3, whereas surprisingly low values were observed for triglyceride-rich lipoproteins. Albumin, IgG and α2-macroglobulin yielded intermediate r values.

Conclusions: This study unveils the factors driving plasma water T_2 as a biomarker for early insulin resistance syndrome. Plasma water T_2 is a promising tool for population screening and metabolic health assessment for diabetes and prediabetes prevention.

Sponsor: N/A
IRB/IACUC#: 2013-205

806 - Poster **Classification:** GSBS Student

Presenter: Vipulkumar Patel **Department:** Institute for Cardiovascular and Metabolic Disease
Authors: Vipulkumar Patel, UNT Health Science Center, Texas Tech University Health Sciences Center El Paso; Sneha Deodhar, UNT Health Science Center; Ina Mishra, UNT Health Science Center, Texas Tech University Health Sciences Center El Paso; David Cistola, UNT Health Science Center, Texas Tech University Health Sciences Center El Paso

Benchtop NMR Relaxometry in Clinical Diagnostics: Whole Human Blood

Purpose: Benchtop NMR relaxometry is a promising technology for metabolic heath screening and assessment. Unlike spectrometry and imaging, NMR relaxometry uses compact and inexpensive devices, making it practical for clinical laboratories and point-of-care settings. In previous work, we reported that the water transverse relaxation time (T_2) of human blood plasma is a sensitive and specific marker for early insulin resistance syndrome. Here, we investigated whether whole human blood could be analyzed directly, thus avoiding the centrifugation step and saving time and expense. During sample equilibration, anticoagulated whole blood sediments spontaneously inside the NMR tube, creating a cell pellet and a plasma supernatant. We exploited this phenomenon and designed experiments to measure the T_2 values of the pellet and supernatant simultaneously. The goal of this study was to quantify the association of whole blood T_2 values with over 200 established blood biomarkers in order to assess information content of the T_2 data.

Methods: We recruited 45 asymptomatic, non-diabetic human volunteers through an IRB-approved protocol. Blood samples were collected after an overnight fast, and NMR relaxation times were measured using a Bruker Minispec mq20 and a modified Carr-Purcell-Meiboom-Gill pulse scheme. The exponential decay curves were analyzed using a discrete inverse Laplace transform algorithm, as implemented in XpFIT (Alango, Ltd.), to extract T_2 values. In addition, diagnostic testing was performed on each blood sample, mostly by Quest Diagnostics, Inc. and Atherotech, Inc.

Results: The settled blood gives two distinct T_2 values corresponding to supernatant (T_{2S}) and cell pellet (T_{2P}). Surprisingly, supernatant T_{2S} correlates with red blood cell and hemoglobin markers, even though it lacks both red blood cell and hemoglobin after sedimentation. Therefore, we hypothesized that the paramagnetic deoxyhemoglobin from the cell pellet exerts a long-range influence on the plasma supernatant. This hypothesis was tested by a simulated hematocrit experiment that varied the height of the blood cell pellet, and a gadolinium experiment that altered the relaxation of samples that were physically separated. The cell pellet T_{2P} correlates with insulin and lipid biomarkers from the blood.

Conclusions: The results demonstrate that whole blood T_2 values report on insulin resistance status, as well as hematocrit and hemoglobin levels.

Sponsor: Garvey Texas Foundation, Texas Tech University Health Sciences Center El Paso
IRB/IACUC#: 2013-205

807 - Poster **Classification:** School of Health Professions Student
Presenter: Taylor Runeberg **Department:** Physician Assistant Studies
Authors: Taylor Runeberg, UNT Health Science Center; Emily Bengston, UNT Health Science Center; Hailey Armstrong, UNT Health Science Center; Jaime Dorth, UNT Health Science Center; Jessica Hartos, UNT Health Science Center

Is Binge Drinking a Risk Factor for Diabetes in Middle Aged Males?

Introduction: Diabetes is a major health issue in the United States with multiple behavioral and genetic risk factors, but little is known about the relationship between binge drinking and the development of diabetes in different age and gender groups. The purpose of this study was to assess whether binge drinking is a risk factor for diabetes in middle aged males.

Methods: This cross-sectional analysis used data from the 2014 BRFSS for males aged 30-50 from Arkansas, Mississippi, New Mexico, and Tennessee. The relationship between diabetes status and binge drinking was analyzed using multiple logistic regression controlling for age, ethnicity/race, educational level (SES), weight status, exercise, and smoking status.

Results: Few participants in the target population reported ever being diagnosed with diabetes (7-9%), and about one-fifth reported binge drinking (19-24%). After controlling for behavioral risk factors and demographics, binge drinking and diabetes were not significantly related in any state, but obesity was positively related (large effect size) to diabetes in three of four states.

Conclusions: Overall, binge drinking was not related to diabetes in middle aged men but was significantly related to weight status. While this study is restricted by cross sectional study design and limited measurement of variables, it is recommended that practitioners understand the relationship between diabetes and obesity and educate their patients about the many comorbid and detrimental effects it can have on a patient's overall health. Additionally, because one in five participants reported binge drinking, patient education about the health risks associated with excessive drinking should continue to occur by practitioners.

Sponsor: N/A
IRB/IACUC#: 2016-074

808 - Poster **Classification:** School of Health Professions Student
Presenter: Veronica Salaices, PA-S **Department:** Physician Assistant Studies
Authors: Veronica Salaices, UNT Health Science Center; Chiamaka Ihediwa, UNT Health Science Center; Vic Holmes, UNT Health Science Center; Jessica Hartos, UNT Health Science Center

For General Health, Does Diabetes Status Differ by Veteran Status in Males Ages 25 to 45?

Introduction: Diabetes mellitus is a chronic medical condition in the U.S. population and in the veteran population, but little information is available for the relationship between diabetes and veteran status for different age groups. Thus, the purpose of this study was to assess whether diabetes status differs by veteran status in males ages 25 to 45.

Methods: This cross sectional analysis used 2014 BRFSS data for males ages 25 to 45 from Alabama, Georgia, and Texas. Multiple logistic regression analysis was used to assess the relationship between diabetes status and veteran status, while controlling for age, ethnicity/race, weight status, mental health, heart disease, tobacco use, and alcohol use.

Results: Across states, few males ages 25-45 reported diabetes (4-7%) or veteran status (14-19%). After controlling for psychosocial and demographic factors, diabetes status was not significantly related to veteran status in any of the 3 states.

Conclusions: Overall, diabetes was not related to veteran status in representative samples of males ages 25 to 45. Additionally, the prevalence of both diabetes status and veteran status was low. The study was limited by the dichotomous measurement of the variables which did not provide additional pertinent information about their diagnosis or military role. It is recommended that clinicians screen for diabetes in this age group if there are symptoms, especially in those that are older as diabetes may become more prevalent as men age.

Sponsor: N/A
IRB/IACUC#: 2016-074

Education (Abstracts in the 900s)

901 - Poster **Classification:** Pharmacy Student
Presenter: Kevin Mukasa **Department:** College of Pharmacy
Authors: Patrick Clay, UNT Health Science Center; Kevin Mukasa Mr, UNT Health Science Center; Oscar Torres, UNT Health Science Center

A Retrospective Analysis and Curricular Mapping Assessment of Student Engagement in Research Design in Classes Offered by the College of Pharmacy at University of North Texas Health Science Center at Fort Worth

Purpose: Currently, UNTSCP does not have a process or a methodology developed to identify classes within its curriculum that offer the opportunity to learn, understand, and/or develop research design as outlined by the ACPE in 2016 Standards document. The aim of this study is to create a methodology and physical repository necessary to identify and classify core and elective classes offered by UNTSCP, which have provided opportunities in "research design". This study is being submitted to receive feedback from students and faculty on classes, where at least one of the four key components of research design is presented, discussed, tested and actively practiced as outlined in the 2016 Standards document created by ACPE.

Significance: The tool developed in our research will potentially allow pharmacy students to search for and identify classes offered at UNTSCP that have provided exposure to research design and identify which of the four key components of research design each class has covered. Faculty may even use the results of this study to elicit changes to the class curriculum.

In addition, the administration of UNTSCP has its first full accreditation review in May 2017. To prepare for this, the administration of UNTSCP may use the results of this quality assurance project to show its compliance/adherence to the 2016 standards in the section detailing "Research Design."

Materials and Methods: Three stages will be undertaken in order to achieve the specific aims outlined. These stages include a curricular mapping assessment looking at course syllabus objectives and then verifying the results obtained with students through surveys and faculty via personal interviews.

Conclusions: The results of this quality assurance project may lead to increased reproducible and meaningful research conducted by students and faculty at UNTSCP as a result of improved or increased research design experiences in the offered curriculum. This project could also lead to assessments done in other schools within UNTHSC such as School of Public Health, School of Health Professionals, and Texas College of Osteopathic Medicine (TCOM).

Sponsor: N/A
IRB/IACUC#: N/A

902 - Poster **Classification:** Faculty (Not for Competition)
Presenter: Kathryn J. Dolan, Ph.D. **Department:** Family Medicine
Authors: Kathryn Dolan Ph.D., UNT Health Science Center; Mei Yang Ph.D., UNT Health Science Center

Role of Service Learning in Medical Students' Clinical and Professionalism Competencies

Background: The role of service learning in students' acquisition of knowledge, skills and professional attitudes is poorly understood. Osteopathic medical students perform service during the first two years as one of the required elements of their 'doctoring' course. The availability of this data provides opportunities to more systematically examine the role of service learning in students' acquisition of clinical skills and professional attitudes.

Methods: Self-report data from osteopathic medical students' required service is required for each activity or event and is now collected electronically. Starting in Fall 2015 semester, this data is now collected electronically. Data includes the type of service, and Likert scale ratings of students overall satisfaction with the experience, and the extent to which each activity meets certain learning objectives and promotes professional values such as service, integrity, respect and collaboration.

Results: Data from 690 students with a total of 4,700 service learning evaluation reports are available for analysis. The most common types of service are assisting at indigent clinics, health fairs, sporting events, health education and safety for children and direct health services including OMM. The majority of students strongly agreed or agreed the overall experience of a specific event was good for of them. The majority strongly agreed clinical skills objectives were met during homeless services events and for school and sports physicals. Students ratings of the extent to which various service activities promoted UNTHSC values vary. Basic descriptive statistics facilitate understanding of students' attitudes toward various types of service activities and generate additional hypotheses regarding satisfaction, learning objectives and professional values.

Conclusions: Service learning is designed to provide opportunities for students to engage in experiential learning which is task and problem specific, improve their clinical skills, and experience the benefits of altruistic behavior. The model of learning applied here originated with John Dewey (1938) and further developed by Kolb (1984), and Boyatzis (2000) who addresses issues of emotional intelligence in professional competencies. This is a step in understanding on the impact of service learning in meeting specific objectives in medical education.

Sponsor: N/A
IRB/IACUC#: IRB # 2015-159

903 - Poster **Classification:** TCOM DO Student
Presenter: Madison Edwards **Department:** Obstetrics and Gynecology
Authors: Madison Edwards, UNT Health Science Center; Andy Vu, UNT Health Science Center; Marth Felini, UNT Health Science Center

Factors Influencing a Medical Student's Choice of Specialty

Background: Specialty selection by medical students is a complex decision driven by many factors. The goal of this study was to understand and quantify factors of primary importance as assessed by the students themselves when choosing a medical specialty.

Materials and Methods: One hundred and forty five of 230 (63%) medical students in Year 2 at Texas College of Osteopathic Medicine completed an online survey using Qualtrics. The 38 question survey was used to collect demographics and most desired specialty choices at time of survey. Students were also asked to rate the importance of 27 pre-selected factors involved in specialty choice. Responses were measured on a likert scale of 0 (very uninfluential) to 10 (very influential). The same online survey was dispersed in Year 3 after clinical rotations were complete (n=92, 40% response rate). Principal factor analysis with promax rotation was conducted to calculate eigenvalues and generate scree plots for determining the most appropriate factor solution.

Results: Seventy three participants completed the pre-rotation survey and a subsequent post-rotation survey. Over half (59%) were female, 63% were Caucasian, and ages ranged from 22 to 38 years old. The top specialty choices prior to Year 3 rotations was Dermatology and Neurology; choices changed to Family Practice and OB/GYN or Pediatrics after Year 3 rotations. The highest ranking factor influencing choice of specialty was having a positive Year 3 rotation followed by the ability to do major and minor procedures within their field of choice. Ten of 25 factors assessed decreased in importance significantly after post rotation. Four factors with eigenvalues >1 accounted for 85.4% of common variance. These factors explained the largest variances across the 25 factors and included academic performance, personal value, early role model, and future time investment.

Conclusions: Factors influential in determining specialty choice change after year 3 clinical rotations. The results of this research can be utilized by medical schools as a platform to adapt to the education of this generation of medical students.

Sponsor: N/A
IRB/IACUC#: 2015-004

904 - Poster **Classification:** SPH Student
Presenter: Taylor Keplin **Department:** Geriatrics
Authors: Taylor Keplin, UNT Health Science Center; Sandra Marquez-Hall, UNT Health Science Center

Evaluating the Impact of the Core Geriatric Clerkship

Purpose: Clinical clerkships provide training for medical students in concentrated areas of study. A component of the Reynold's Interprofessional Geriatric Education & Training in Texas (IGET-IT) program is the Core Geriatric Clerkship. Knowledge of geriatrics is gained through self-study, case reviews, and clinical case discussions. The goals of the clerkship were aligned with the eight AACOM Osteopathic Core Competencies for medical students, including Osteopathic Principles and Practices, Medical Knowledge, Patient Care, Interpersonal and Communication Skills, Professionalism, Practice-Based Learning and Improvement, Systems-Based Practice, and Health Promotion/Disease Prevention. This study examined the geriatric clerkship and whether or not it improved the ability of medical students in AACOM competency areas.

Methods: Students were required to take a pre and post self-assessment of ability in nine competency areas. The instrument asked students to rate their ability on a 4-point Likert scale, ranging from 1-4; (1) no ability, (2) some ability, (3) significant ability, and (4) complete ability. Data were collected over a five year period (2011-2016) with a total of N=1024 responses collected. A paired T-test for significance as well as mean responses were calculated using SAS Version 9.3.

Results: A statistical difference ($p< 0.05$) was found between pre- and post- results for all competencies. Mean scores were calculated and the greatest areas of improved ability were found in End of Life Care with a 51% increase between pre- and post- assessment results and Community Resources (48%) ; with somewhat less increase in Continuum of Care (46%), Neuropsychological Testing (44%), and Geriatric Syndromes (34%). Lowest levels of improved ability were found in Home Safety Evaluation (32%), Medication Reviews (27%), Osteopathic Principles (22%), and Professionalism (10%).

Conclusions: Including a mandatory geriatric clerkship for fourth year students provided a way for undergraduate medical students to increase their knowledge and self-efficacy in the care of aging adults. The core geriatric clerkship pre- and post- survey results showed increased confidence levels in all the competency areas measured.

Sponsor: N/A
IRB/IACUC#: 2009-076

905 - Poster **Classification:** Pharmacy Student

Presenter: David Rhoads **Department:** Institute for Patient Safety

Authors: David Rhoads, UNT Health Science Center; Annesha White, UNT Health Science Center; Kimberly Vernachio PharmD, Vernachio Managed Care Consulting; Simone Jiandani PharmD, Vernachio Managed Care Consulting; John Licciardone DO, MBA, UNT Health Science Center; Tammy Barbé PhD, RN, Mercer University; Sumihiro Suzuki PhD, UNT Health Science Center

Improving Pain Management Education in US Medical, Nursing, and Pharmacy Schools: Making an Impact on Patient Safety

Objective: Over 100 million patients in the US deal with some sort of pain. The NIH has considered pain management one of the most urgent problems facing health care today. The number of opioid prescriptions has been increasing over the past several decades and along with this the rate of opioid overdose deaths has nearly tripled in the past fifteen years. Proper pain management by health professionals can lead to better patient outcomes including patient safety. However, evidence has suggested that pain management education is not being sufficiently addressed in pre-licensure programs such as nursing, medicine, and pharmacy. The objective of this study is to examine current practices in pain management education within medical, nursing, and pharmacy schools, identify educational gaps, and make recommendations for improvement in education.

Methods: This descriptive cross sectional study focused on pre-licensure programs in medicine, nursing, and pharmacy. A two-part survey was administered to schools nationwide to evaluate the depth and breadth of pain education. The first part of the survey focused on questions regarding the scope, quantity, and delivery of pain education. This part was adapted from a previous survey by Mezei and colleagues to assess pain curricula in US and Canadian schools. The second part of the survey focused on opioid education. The survey also assessed different teaching methods that are used, and additional demographic information regarding the participating institutions.

Results: This study is ongoing with results from the survey still being received. Preliminary results show that the most common teaching methods used are didactic lectures, as well as case-based activities and clinical experience. Few institutions are utilizing team-based and interprofessional learning. When looking at opioid education, results show that programs are consistently providing education about behavorial and non-pharmacological management. However, interventional methods, and opioid contracts are not widely taught. Once the survey is completed, analysis of variance (ANOVA) will be conducted to look for differences between educational program types as well as geographical regions.

Conclusions: Based on early results, it is clear that pain education needs to focus more on patient education, and interprofessional learning opportunities. Improving pain education should not just focus on the quantity of time spent in teaching students, but also the quality of educational experiences delivered. Didactic teaching still seems to be the most common method used, but students would benefit from the opportunity of more interprofessional activities as well as team-based learning. The consensus is that medical, pharmacy, and nursing schools should establish formal pain management education in each year of their curricula. Through improving pain management education, health care professionals of the future will be better prepared to manage their patients, which will directly result in improved outcomes, and patient safety.

Sponsor: Institute for Patient Safety **IRB/IACUC#:** 2016-144

906 - Poster **Classification:** School of Health Professions Student

Presenter: Mike Richardson **Department:** Physical Therapy

Authors: Mike Richardson, UNT Health Science Center; Evan Papa, UNT Health Science Center; Kimberly Mabutas, UNT Health Science Center; Spencer Noble, UNT Health Science Center; Mikyla Vastine, UNT Health Science Center

Correlation Between Online Content Viewing and Classroom Performance

Purpose: Several physical therapy programs have applied flipped teaching methods to deliver content within the expanding physical therapy curricula. A study at a health professions school showed at least 90% of students felt a flipped class promoted understanding and application of material. Additionally, graduate students enrolled in a modified flipped class scored significantly higher ($P < 0.05$) on multiple exam sections. The purpose of this study was to determine how consumption of flipped material correlates with class performance for year one Doctor of Physical Therapy (DPT) students. We hypothesize that time viewing at-home lecture material will be significantly related to exam performance.

Methods: Forty-four first year DPT students completed a final practical and a comprehensive written exam as part of a Therapeutic Interventions I class. Exam and overall course grades were compared to weekly viewing times provided by the Canvas Learning Management System. All participants were provided with electronic informed consent. This study was approved by the Institutional Review Board at the University of North Texas Health Science Center (UNTHSC).

Results: Increase in weekly time viewing at-home lecture material was correlated with increase in both written and practical exam scores, $r(44)=0.383$, $p=0.009$, and $r(44) =0.424$, $p=0.003$. There was a low correlation between weekly viewing time and achievement of 90^{th} and 20^{th} percentile class ranks, $r(44)= -0.373$, $p=0.011$ and $r(44)=0.336$, $p=0.02$. The ROC analyses demonstrated weekly viewing time had good ability to discriminate between students who scored in 90^{th} and 10^{th} percentiles on the comprehensive exam (AUC=0.87; 0.80, P=0.014; 0.005) and overall class grades (AUC=0.82, P=0.007). The cutoff point showed students had to view the minimum of 30.8 minutes each week to achieve the 90^{th} percentile, 25.5 minutes or more to earn an 'A', and 18.9 or fewer minutes to obtain the 10^{th} percentile.

Conclusions: Weekly viewing time is associated with student performance on exams. Time spent viewing lecture material per week predicts various levels of success or poor performance in the flipped class. This sample was limited to year 1 DPT students at UNTHSC in one course and may not be generalizable beyond these conditions.

Sponsor: N/A
IRB/IACUC#: 2016-019

Eye / Vision (Abstracts in the 1000s)

1000 - Poster **Classification:** Faculty (Not for Competition)
Presenter: Suchismita Acharya **Department:** North Texas Eye Research Institute
Authors: Suchismita Acharya PhD, UNT Health Science Center; Santosh Panda PhD, AyuVis Reseach; Jiyang Cai PhD, University of Texas Medical Branch; Dorota L. Stankowska PhD, UNT Health Science Center; Rafael Ufret-Vincenty MD, UT Southwestern Medical Center

Multifunctional Small Molecule TLR4 Antagonist for Treating Ocular Neovascularization

Purpose: The multifactorial pathological challenge of ocular neovascularization is difficult to address so far only by anti-VEGF therapy. We have tested our hypothesis that, a novel class of natural product derived compound with toll like receptor 4 (TLR4) antagonist activity can ameliorate the hyper-inflammation produced by macrophage/macroglia over activation as well as decrease choroidal neovascularization (CNV) size in mice.

Methods: Inhibition of cytokines: Mouse bone marrow derived macrophages were treated with high mobility group box1 (HMGB1, 100 ng/mL), an endogenous TLR4 ligand for 8 hours, with or without 100 mg/mL of test compounds. The mRNA levels of TNF-a, iNOS were measured by real-time RT-PCR, and normalized to the control cells. Inhibition of VEGF production: ARPE-19 cells were treated either with 100ng/mL or without HMGB1 along with the compounds (50μg/mL) for 24 h. Supernatants were collected and assayed using human VEGF ELISA kit according to manufacturer's instructions. Experiments were repeated three times and one way ANOVA was used for statistical analysis. Inhibition of CNV: Laser CNV was induced in C57BL/6 mice (male, 10-12 weeks, n = 5). Each eye received 4 laser burns. The compounds (200 μg/mL) or BSS (vehicle) were administered by IP injection once before and once daily up to 10 days following laser injury. Fundus fluorescein angiography and optical coherence tomography was used to visualize the CNV lesions. RPE/choroid/sclera flat mounts were prepared and stained with both FITC conjugated isolectin B4 and anti-ICAM-2 antibody to quantitatively measure the size of CNV lesion.

Results: Compound treatment significantly ($p<0.05$) decreased TNF-a, iNOS level in macrophages compared to HMGB1 (control). Compound C-Heptaose significantly decrease the production of VEGF (118.75±8.18ng/mL) in ARPE-19 cells as compared to HMGB1 (185.42±18.5 ng/mL) and was comparable to untreated control (108.04±16.15 ng/mL). Intraperitoneal injections of C-Heptaose reduced the average size of CNV lesions to about 50% ($p<0.05$, n = 2) of those in control mice treated with vehicle only in the mouse model.

Conclusions: Our results are consistent with our hypothesis that this novel class of compounds will decrease ocular inflammation and neovascularization. Further structure optimization of the lead compound and TLR4 dependent and independent mechanistic investigation are underway.

Sponsor: N/A
IRB/IACUC#: Done at UTSWMC as part of contract research from AyuVis

1001 - Poster **Classification:** GSBS Student

Presenter: Elliott M. Allums **Department:** North Texas Eye Research Institute

Authors: Elliott Allums, UNT Health Science Center; Yang Liu, North Texas Eye Research Institute, UNT Health Science Center; Abbot Clark, North Texas Eye Research Institute, UNT Health Science Center

C1q Induction and Glial Activation Following Optic Nerve Injury

Purpose: Complement protein 1 subunit q (C1q) is a component of the C1 complex of the classical pathway of complement activation. It plays a role in synaptic development and pruning of central nervous system, as well as in the pathogenesis of various neurodegenerative diseases. In this study, we characterized C1q expression in C57BL/6J mice in an optic nerve crush (ONC) model of neurodegeneration. We also examined glial activation to determine possible sources of the increased C1q expression.

Methods: Acute injury was induced in adult C57BL/6J mice by intraorbital ONC performed approximately 1 mm posterior to the optic nerve head with self-closing forceps for four seconds. C1q expression and glial activation (GFAP) was determined at 3 and 7 days post ONC by immunohistochemistry (IHC) as well as Western Blotting.

Results: C1q expression increased in the crush site in the optic nerve, the inner plexiform layer (IPL) and the outer plexiform layer (OPL) of the retina 3 days after ONC. C1q expression further increased 7 days after ONC in the crush site, IPL, OPL, as well as the ganglion cell layer (GCL). Optic nerve injury increased glial fibrillary acidic protein (GFAP) expression in the GCL layer, extending through the retinal layers, 7 days post ONC and ED1 expression in the crush site 3 and 7 days following ONC.

Conclusions: This study shows that C1q may play a role in neurodegeneration and could have potential as a therapeutic target. Glial cells may be responsible for the increased expression in C1q following ONC.

Sponsor: DOD VISION grant W81XWH-10-2-003
IRB/IACUC#: IACUC-2015-0002

1002 - Poster **Classification:** GSBS Student

Presenter: Renuka Chaphalkar **Department:** North Texas Eye Research Institute

Authors: Renuka Chaphalkar, UNT Health Science Center; Raghu Krishnamoorthy, UNT Health Science Center; Dorota Stankowska PhD, UNT Health Science Center

Endothelin Mediated Changes in Gene Expression Determined by RNA-sequencing of the Translatome in Primary Retinal Ganglion Cells

Purpose: Endothelin treatment has been shown to produce increased cell death in primary RGCs, however the underlying changes in gene expression are not completely understood. The purpose of the study was to assess endothelin-mediated changes in mRNA expression that occur at the translational level.

Methods: Primary RGCs were isolated from post-natal day 5 rat pups by immunopanning with an antibody to Thy1.1. RGCs obtained were allowed to attach and maintained for 7 days for neurite outgrowth to occur. The RGCs were either untreated or treated with endothelin-1 (100 nM) for 24 h in trophic factor-free medium. Following brief incubation with cycloheximide to inhibit protein synthesis, total polysomes were isolated by magnesium precipitation and polysomal RNA was extracted using the Trizol reagent. Libraries for RNA-Seq were prepared with KAPA Stranded RNA-Seq Kit. Different adaptors were used for multiplexing samples in one lane. Sequencing was performed on Illumina Hiseq3000/4000 for a pair end 150 run. The reads were first mapped to the latest UCSC transcript set using STAR version 2.4.1d and the gene expression level was quantified to annotation model (Partek E/M). Differentially expressed genes were identified using differential gene expression (GSA) algorithm in Partek. Genes showing altered expression with $p < 0.05$ and more than 2-fold changes were considered differentially expressed.

Results: Analysis of gene ontology of the changes in gene expression revealed a significant increase in expression of several mitochondrial genes including mitochondrial intermediate peptidase (MIPEP) (3.3-fold), cytochrome c oxidase assembly factor (SURF1) (8.7-fold) and Apolipoprotein O Like (APOOL) (7.5-fold). On the other hand, a decrease in expression of mitochondrial genes cytochrome c oxidase subunit 4I2 (8-fold), cytochrome c oxidase 6B2 (8-fold), and DNA polymerase gamma 2 (POLG2) (7-fold) was observed.

Conclusions: Analysis of the translatome offers a glimpse into de novo protein synthesis which is an important manifestation of changes in gene expression. Endothelin treatment produced changes in several key regulators of mitochondrial metabolism and bioenergetics which could be indicative of their involvement in neurodegeneration in glaucoma.

Sponsor: N/A

IRB/IACUC#: 2013/14-44-A05

1003 - Poster **Classification:** TCOM DO Student

Presenter: Daniel Goan **Department:** North Texas Eye Research Institute

Authors: Daniel Goan, UNT Health Science Center; Nghia Nguyen, UNT Health Science Center; Hannah Webber, UNT Health Science Center; Jaclyn Bermudez, UNT Health Science Center; Abbot F. Clark, UNT Health Science Center; Weiming Mao, UNT Health Science Center

Application of the CRISPR Interference Method In Regulating Tgfβ2 In The Trabecular Meshwork

Introduction: Glaucoma is an eye disease that damages the optic nerve and leads to gradual loss of vision. Glaucoma is the second leading cause of blindness globally. The trabecular meshwork (TM) is an ocular tissue responsible for controlling and drainage the aqueous humor which is a fluid that fills the eye. In primary open angle glaucoma (POAG), the most frequent type of glaucoma, there is a dysfunction within the TM that decreases the outflow of aqueous humor and elevates intraocular pressure (IOP). Transforming growth factor beta 2 (TGFβ2) is a protein that controls cell growth, differentiation, proliferation, and apoptosis. Many studies have shown that elevated TGFβ2 induces glaucoma phenotypes in the eye, including elevated IOP. Therefore, lowering TGFβ2 levels in the TM is a potential therapeutic strategy for treating glaucomatous changes in the TM as well as lowering IOP. Since our published study showed that elevated TGFβ2 is likely due to histone hyperacetylation, the purpose of this study was to determine whether the novel CRISPR interference technology, which is able to deacetylate histones in a gene-specific manner, is suitable for the manipulation of TGFβ2 levels in the TM.

Methods: Four sets of oligos were designed close to the transcriptional start site of the TGFβ2 gene using the online CRISPR sgRNA design tool (http://crispr.mit.edu/) for the construction of sgRNAs. These oligos were sub-cloned into the target sgRNA expression vector (Addgene). The dCas9-KRAB expression vector was purchased from Addgene. The sgRNA expression vector and dCas9-KRAB vector were co-transfected in transformed human TM cells (GTM3). Four days after transfection, we isolated mRNA and protein for quantitative PCR (qPCR) and Western immunoblotting analyses.

Results: The expression of dCas9-KRAB and/or sgRNA did not show toxicity to GTM3 cells. qPCR analysis showed that the 2 two-vector system dramatically repressed the level of TGFβ2 in GTM3 cells.

Conclusions: The CRISPR/dCAS9 interference method is effective in lowering the level of TGFβ2 in the HTM. Further studies are required to determine the specificity and suitability of this technology in other genes and primary human TM cells.

Sponsor: N/A
IRB/IACUC#: N/A

1004 - Poster **Classification:** TCOM DO Student

Presenter: Hayden Jefferies **Department:** Texas College of Osteopathic Medicine
Authors: Hayden Jefferies B.S., UNT Health Science Center; Nolan McGrady B.S., UNT Health Science Center; Raghu Krishnamoorthy PhD, UNT Health Science Center

Neuroprotective Effects of an Endothelin Receptor Antagonist in a Rat Model of Ocular Hypertension

Purpose: Endothelin 1 is elevated in both patients and in animal models of glaucoma and has been shown to contribute to neurodegeneration. Since endothelin 1 acts through two receptors, endothelin A receptor and endothelin B receptor, the purpose of this study is to determine if antagonism of both endothelin receptors by Macitentan can promote neuroprotection during intraocular pressure (IOP) elevation in rats.

Methods: IOP was elevated in the left eye of adult male retired breeder Brown Norway rats using Morrison's model of ocular hypertension (injection of hypertonic saline through episcleral veins) and maintained for 4 weeks. Contralateral eyes served as the corresponding contralateral controls. Rats were then separated into treated and untreated groups, with the treated group receiving Macitentan (10 mg/kg) 3 times per week in the diet (administered in gel packs). After one month of treatment, rats were sacrificed and retinal flat mounts were prepared for both IOP elevated and contralateral eyes of both the treated and untreated rats. The flat mounts were immunostained for the retinal ganglion cell-specific marker Brn3a, imaged in a confocal microscope and masked cell counts were performed.

Results: IOP elevation in untreated rats showed a dramatic decline in retinal ganglion cell counts compared to the contralateral controls, whereas rats treated with Macitentan showed significant preservation of retinal ganglion cell numbers.

Conclusions: Currently, therapies for the treatment of glaucoma are solely focused on the reduction of IOP. The study described herewith demonstrates the ability of a dual endothelin receptor antagonist, Macitentan, to promote retinal ganglion cell survival independent of IOP. Due to its IOP independent action, this therapy could be developed for neuroprotection either independent or concurrent with available glaucoma therapies.

Sponsor: National Institute of Health; TCOM Honors Research Practicum
IRB/IACUC#: 2013/14-44-A05

1005 - Poster **Classification:** Postdoctoral Fellow

Presenter: Ramesh B Kasetti **Department:** North Texas Eye Research Institute

Authors: Ramesh Kasetti, UNT Health Science Center; Prabhavathi Maddineni, UNT Health Science Center; Pinkal Patel, UNT Health Science Center; Cameron Millar PhD, UNT Health Science Center; Tien Phan, UNT Health Science Center; Charles Searby, University of Iowa; Abbot F. Clark, UNT Health Science Center; Val Sheffield, University of Iowa; Gulab Zode, UNT Health Science Center

Inhibition of Transforming Growth Factor-β2 Signaling Prevents ECM Remodeling, Endoplasmic Reticulum Stress and Ocular Hypertension in Steroid-induced Glaucoma

Purpose: Ocular hypertension is a serious side effect of glucocorticoid (GC) therapy. Abnormal accumulation of extracellular matrix (ECM) and chronic endoplasmic reticulum (ER) stress in the trabecular meshwork (TM) is associated with GC-induced ocular hypertension. In the present study, we examined the role of TGFβ2 signaling in dexamethasone (Dex)-induced ECM remodeling, ER stress and ocular hypertension.

Methods: Conscious IOP and outflow facility was measured in C57 mice treated with vehicle or Dex eye drops up to 7-weeks. TGFβ2 & fibronectin levels in the aqueous humor (AH) were analyzed by Western blotting. Effect of inhibition of TGFβ signaling on Dex-induced ER stress and ECM accumulation was examined by Western blot, immunostaining & Smad reporter assay in TM cells treated with or without TGFβ signaling inhibitors (SIS3 and LY364947). To further examine the role of TGF-β2 signaling, IOP, ECM and ER stress was examined in WT or $Smad3^{-/-}$ mice treated with Dex.

Results: Dexamethasone (Dex) mediated reduction of outflow facility and IOP elevation is associated with increased abnormal extracellular matrix (ECM) accumulation in the TM, inducing ER stress. Biochemical analysis of the aqueous humor samples from Dex-treated eyes revealed significantly increased bioactive form of transforming growth factor-β2 (TGF-β2), a major regulator of ECM in the TM. Dex treatment increased both precursor and bioactive form of TGF-β2 in the conditioned medium and activated TGF-β2-induced Smad signaling pathway in primary human TM cells as evident from increased phosphorylation of Smad3 and increased Smad luciferase activity. Inhibition of TGF-β2 signaling significantly reduced Dex-induced abnormal intracellular ECM accumulation and ER stress in human TM cells. $Smad3^{-/-}$ mice, which are required for TGF-β2 signaling, protected from Dex-induced ocular hypertension, ER stress and abnormal ECM accumulation further indicating the role of TGF-β2 signaling in GC-induced glaucoma. Interestingly, knock out of ER stress-induced transcriptional factors, ATF4 and CHOP prevented activation of TGF-β2 signaling and also reduced intracellular ECM accumulation in the TM, thus preventing Dex-induced ER stress and IOP elevation.

Conclusions: These studies indicate that Dex-induced TGF-β2 signaling is responsible for ECM remodeling, ER stress and elevation of IOP in GC-induced glaucoma.

Sponsor: National Eye Institute (Bethesda, MD, USA), EY022077 (R00; GSZ) and EY026177 (R01; GSZ) and funding from the North Texas Eye Research Institute (Fort Worth, TX, USA).
IRB/IACUC#: 2015/0002

1006 - Poster **Classification:** Postdoctoral Fellow
Presenter: Xiaobin Liu **Department:** Pharmaceutical Science
Authors: Xiaobin Liu, UNT Heatlh Science Center; Christy Xavier, UNT Health Science Center; Hongli Wu, School of Pharmacy

Role Of Glutaredoxin 2 (Grx2) in Protecting the Retina from Light-Induced Damage

Purpose: Glutaredoxin 2 (Grx2), a glutathione-dependent oxidoreductase, is known to repair oxidative damage of protein thiol groups and also serve as electron donors for ribonucleotide reductase. Grx2 is highly expressed in tissues with high energy demand like heart, brain, liver, and kidney. Our previous study has shown that Grx2 is highly expressed in the neural retina where its physiological functions remain completely unknown. In this study, we evaluated the role of Grx2 in protecting the retina from light-induced damage by using Grx2 gene knockout (KO) mice as a model.

Methods: Wild type (WT) and Grx2 KO mice were exposed to white light at 12,000 lux for 1 hour after dark adaptation. The retinal damage was evaluated by the electroretinogram (ERG) recording, spectral domain optical coherence tomography (SD-OCT) measurement, and fundus examination. Hematoxylin and Eosin (H&E) staining was used to analyze the morphological changes in the retina. To better understand the molecular basis of how Grx2 protects the retina from light induced damage, we performed the whole transcriptome shotgun sequencing (RNA-seq) to analyze the full transcriptome of the retinal tissue in light-exposed Grx2 KO mice. The gene network was explored using DESeq2 pathway analysis software. The selected genes of interest were further confirmed by real-time PCR and Western Blot.

Results: Light-exposed Grx2 KO mice showed severe loss of both a- and b-wave amplitudes and the outer nuclear layer (ONL) in the Grx2 deficient mice was significantly thinner compared to that of light-exposed WT mice. We identified thousands of genes with statistical significant expression changes and classified them into cellular processes and molecular pathways. Interestingly, assessment of gene expression profile indicated that several nuclear factor erythroid 2 (Nrf2) regulated antioxidant genes including SOD1, NQO1, and catalase were dysregulated in Grx2 KO mice, which indicated that Grx2 may be a novel regulator of the Nrf2 defense pathway.

Conclusions: Our results suggest that Grx2 may protect the retina from light-induced retinal degeneration. The protective effects of Grx2 in the retina may be explained at least in part by its ability to control the Nrf2 signaling pathway.

Sponsor: BrightFocus Foundation for Macular Degeneration
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1007 - Poster **Classification:** GSBS Student

Presenter: Navita N. Lopez **Department:** Graduate School of Biomedical Sciences

Authors: Navita Lopez MSc, UNT Health Science Center; Tara Tovar-Vidales MSc, UNT Health Science Center; Abbot Clark PhD, UNT Health Science Center

Transforming Growth Factor β2 Regulates the Expression of microRNAs (miRNAs) in Human Optic Nerve Head Cells

Purpose: microRNAs (miRNAs) are a class of small, endogenous non-coding RNAs that epigenetically regulate post-transcriptional gene expression. miRNAs are known to modulate cellular functions such as extracellular matrix (ECM) turnover. There is evidence that dysregulation of miRNA expression has a role in the pathogenesis of fibrotic diseases including glaucoma. Glaucoma is the leading cause of irreversible blindness and is associated with fibrotic changes to the optic nerve head (ONH), the initial site of glaucomatous damage to the retina and optic nerve. Our previous study showed that expression of the pro-fibrotic cytokine TGFβ2 is elevated in the ONH of glaucoma eyes compared to age-matched normal eye. However, there currently is little knowledge regarding the roles of miRNAs in the ONH. The purpose of this study was to determine if there are differences in expression of pro-fibrotic and anti-fibrotic miRNAs in normal ONH cells treated with or without TGFβ2.

Methods: Primary human ONH cell strains derived from normal donor eyes were grown to 100% confluency. ONH cells were treated with 5ng/ml TGFβ2 or with control medium for 24hrs. RNA was isolated and cDNA synthesis performed for miRNA qPCR arrays to compare expression levels of pro-fibrotic and anti-fibrotic miRNAs in normal human ONH cells treated with or without TGFβ2.

Results: Normal ONH cells exposed to TGFβ2 showed that several anti-fibrotic miRNAs were downregulated (hsa-miR-107, hsa-miR-132-3p, hsa-miR-141-3p hsa-miR-18a-5p, hsa-miR-194-5p, hsa-miR-204-5p) compared to control cells. In contrast, only one pro-fibrotic miRNA was upregulated (hsa-miR-34a-5p) in ONH cells treated with TGFβ2 compared to control. The most prominent targets of these miRNAs include connective tissue growth factor (CTGF), gremlin 2 and lysyl oxidase-like 3 (LOX-L3).

Conclusions: Our results suggest that miRNAs expressed by ONH cells may be regulated by TGFβ2. These miRNAs may target CTGF, crosslinking enzymes and BMP antagonists to modify the ECM in the ONH.

Sponsor: Gaucoma Research Foundation
IRB/IACUC#: N/A

1008 - Poster **Classification:** Postdoctoral Fellow

Presenter: Prabhavathi Maddineni **Department:** North Texas Eye Research Institute
Authors: Prabhavathi Maddineni, UNT Health Science Center; Ramesh Kasetti, UNT Health Science Center; Gulab Zode, UNT Health Science Center

Overexpression of ATF-4 in Trabecular Meshwork Causes Elevation of Intra Ocular Pressure and Reduction of Outflow Facility in a CHOP Dependent Manner

Purpose: Primary open-angle glaucoma (POAG) has been primarily associated with reduced aqueous humor outflow facility through trabecular meshwork (TM) and elevated intraocular pressure (IOP). Studies based on both human as well as mice models revealed that chronic endoplasmic reticulum (ER) stress in TM is one of the causative factors responsible for TM dysfunction and ocular hypertension. The purpose of this study is to examine whether forced expression of UPR downstream pro apoptotic molecules ATF4 and CHOP leads to reduced outflow facility and IOP elevation in normal C57 mice.

Methods: Ad5.ATF-4/Ad5.CHOP/Ad5.empty virus (pfu=$2x10^7$) were injected intravitreally into C57BL/6J or CHOP KO ($CHOP^{-/-}$) mice. Conscious IOP of both the eyes was monitored once in a week until 7 weeks using rebound tonometer. Outflow facility was measured by constant-flow infusion technique. Also, we examined the expression levels of ATF-4 in the TM of age-matched normal and POAG donors by immunohistochemistry.

Results: Forced expression of ATF-4 but not CHOP caused significant IOP elevation (23.97 mmHg in Ad5.ATF4 v/s 14.6 mmHg in Ad5.null mice) and reduced outflow facility (0.022µL/min/mmHg in Ad5.ATF4 v/s 0.04 in Ad5.null mice) in C57BL/6J mice. Elevation of IOP in C57BL/6J was prominent from 3 weeks post injection and sustained until 7 weeks. Interestingly Ad5.ATF-4 did not elevate IOP (17.7 mmHg) in $CHOP^{-}/^{-}$ mice, indicating that ATF-4 interaction with CHOP is the prerequisite for ATF-4-induced IOP elevation. Also, ER stress-induced pro death marker, ATF-4 was significantly increased in human post-mortem glaucomatous TM tissues compared to normal TM tissues. Expression of ATF4 in primary TM cells induced oxidative and ER stress and also upregulated pro-apoptotic markers.

Conclusions: This data indicates that chronic ER marker ATF4 is increased in the glaucomatous TM tissues, which may be associated with TM dysfunction, reduction of outflow facility and IOP elevation via induction of ER and oxidative stress. Furthermore, interaction of ATF-4 and CHOP is essential to carry out downstream signal transduction pathways.

Sponsor: N/A
IRB/IACUC#: 2015/0002

1009 - Poster **Classification:** GSBS Student

Presenter: Nolan R. McGrady **Department:** North Texas Eye Research Institute
Authors: Nolan McGrady, UNT Health Science Center; Dorotoa Stankowska, UNT Health Science Center; Caitlin Rendon, Texas Lutheran University; Raghu R. Krishnamoorthy, UNT Health Science Center

Endothelin Receptors are Targets for Neuroprotection in a Rat Model of Glaucoma

Purpose: The endothelin system has been shown to play a causative role in the neurodegenerative effects seen in animal models of glaucoma. However, the underlying mechanisms are not completely understood. The goal of this study was to investigate the interaction between the ET_A and ET_B receptors and the involvement of the MAP kinase pathways in endothelin mediated cell death and determine if the dual ET_A/ET_B receptor antagonist, macitentan could attenuate neurodegenerative changes following IOP elevation in Brown Norway rats.

Methods: Cultured transformed 661W cells were transiently transfected with a plasmid DNA encoding the ET_A receptor and treated with ET-1 or ET-3 for 24 h. Phosphorylation of extracellular regulated kinase 1/2 (ERK1/2) and c-Jun N-terminal kinase (JNK) was determined by immunoblotting. Wild type and ET_B-deficient Wistar-Kyoto rats were subjected to IOP elevation by the Morrison's method and maintained for 2 weeks. Retinal sections obtained from the rats were subjected to immunohistochemical analysis of ERK1/2 and JNK and their phosphorylation. Brown Norway rats subjected to IOP elevation in one eye were either untreated or treated with macitentan (10 mg/kg body wt) for 1 month. Retinal flatmounts obtained from these rats were used to determine RGC counts following staining with the RBPMS antibody.

Results: Cell culture experiments showed an appreciable upregulation of pERK1/2, while pJNK levels were not appreciably altered, following overexpression of the ET_A receptor in 661W cells. ET_B-deficient rats showed increased immunostaining for pERK1/2 in the nerve fiber layer (NFL), ganglion cell layer (GCL) and inner plexiform layer (IPL), compared to wild type rats. Following IOP elevation, ERK1/2 phosphorylation was greatly reduced in wild type rats, while ET_B-deficient rats showed better preservation of pERK1/2 levels. Conversely, immunostaining for pJNK in wild type rats was increased in the NFL following IOP elevation, but was attenuated in ET_B-deficient rats. Rats fed with macitentan displayed increased RGC survival by 25 to 42% following IOP elevation, compared to untreated rats.

Conclusions: There is a substantial body of evidence for the pro-survival role of ERKs, and the pro-death role of JNKs. The current study points to an involvement of ERK1/2 and JNK signaling with endothelin receptor expression following IOP elevation. Blocking both ET_A and ET_B receptors has neuroprotective effects on RGCs during ocular hypertension.

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1010 - Poster **Classification:** GSBS Student

Presenter: Avani A. Mody **Department:** North Texas Eye Research Institute
Authors: Avani Mody, UNT Health Science Center; Cameron Millar, UNT Health Science Center; Robert Wordinger, UNT Health Science Center; Abbot F. Clark, UNT Health Science Center

Protective Effect of ID Protein on Tgfβ2 Induced Fibrosis in Human Trabecular Meshwork Cells: Implication for Developing a Glaucoma Therapy

Purpose: Primary open angle glaucoma (POAG) is one of the most prevalent forms of glaucoma. Elevated transforming growth factor β2 (TGFβ2) expression in the trabecular meshwork (TM) causes increased deposition of extracellular matrix (ECM) and prevents ECM turnover by increasing expression of plasminogen activator inhibitor-I (PAI-1), leading to elevated intraocular pressure (IOP) in POAG patients. In fibrotic pulmonary diseases, bone morphogenetic proteins (BMP) through induction of inhibitor of DNA binding proteins (ID1, ID3); transcription regulators known to suppress bHLH promoter activity, regulate TGFβ induced ECM production. However, in TM cells the underlying mechanism for BMP4 inhibition of TGFβ2-induced fibrosis remains undetermined. Our study will determine whether ID1 and ID3 proteins are downstream targets of BMP4, which attenuates TGFβ2 induction of ECM proteins in cultured human TM cells.

Methods: Primary human TM (HTM) cells were treated with BMP4 for 0-48hr, and ID1 and ID3 mRNA and protein expression was determined by Q-PCR and western immunoblotting. HTM cells were treated with a BMPR inhibitor to confirm that BMP4 signaling is necessary for induction of ID1 and ID3 protein expression. GTM3 cells were transfected with ID1 or ID3 vectors to determine their inhibitory effects on TGFβ2 induced fibronectin and PAI-1 protein expression. Ad5-CMV-hId1 and Ad5-CMV-hID3 viral vectors along with Ad5-CMV-hTGFb2$^{C226S/C288S}$ were injected intravitreally to observe IOP changes in female Balb/cj mice.

Results: BMP4 significantly induced early expression of ID1 and ID3 mRNA ($p<0.05$) and protein in HTM cells, while the BMPR inhibitor blocked this induction.Overexpression of ID1 and ID3 significantly inhibited TGFβ2-induced expression of fibronectin and PAI-1 in TM cells ($p<0.01$).

Conclusions: BMP4 induced ID1 and ID3 suppresses TGFβ2 induced fibronectin and PAI-1. This makes ID1 and/or ID3 strong candidates for developing disease-modifying IOP lowering therapies.

Sponsor: N/A
IRB/IACUC#: N/A

1011 - Poster **Classification:** GSBS Student

Presenter: Gaurang C. Patel **Department:** North Texas Eye Research Institute

Authors: Gaurang Patel, North Texas Eye Research Institute, UNT Health Science Center; Yang Liu, North Texas Eye Research Institute, UNT Health Science Center; J. Cameron Millar, North Texas Eye Research Institute, UNT Health Science Center; Abbot F. Clark, North Texas Eye Research Institute, UNT Health Science Center

Glucocorticoid Receptor Grβ Regulates Glucocorticoid-Induced Ocular Hypertension and Glaucoma in Mice

Purpose: Glucocorticoid (GC) induced ocular hypertension (OHT) is a serious side effect of prolonged GC therapy and if left untreated it can lead to iatrogenic glaucoma and permanent vision loss. The Alternatively spliced isoform of glucocorticoid receptor GRβ acts as a dominant negative regulator of GC activity. Our previous studies have shown that GRβ regulates GC responsiveness and that overexpressing GRβ in trabecular meshwork (TM) cells inhibits GC-induced and glaucomatous damage in TM cells. The purpose of this study was to determine whether increased expression of GRβ can reverse GC-induced OHT in mice.

Methods: Mouse trabecular meshwork cells (MTM) were transduced with Ad5.null or Ad5.hGRβ expression vectors at MOI-50. After 24 hours MTM cells were treated with dexamethasone (DEX) or vehicle control (0.1% ethanol). To generate GC-OHT, C57BL/6J mice received weekly bilateral periocular (administrated through conjunctival fornix) injections of dexamethasone acetate (DEX-Ac, 200ug/eye). Several weeks after DEX-Ac administration, mouse eyes were injected intravitreally with Ad5.null or Ad5.hGRβ expression vectors ($3x10^7$ pfu/eye) to transduce the TM. Nighttime intraocular pressure (IOP) was measured using a TonoLab rebound tonometer, and outflow facilities were measured in living mice using our constant flow infusion technique. Fibronectin and collagen I expression were evaluated using immunoblotting of mouse anterior segment tissues. The unpaired Student's t-test (2-tailed) and One-way ANOVA were used for statistical analysis.

Results: DEX treatment of MTM cells increased fibronection expression, whereas transduction of MTM cells with Ad5.hGRβ maintained fibronectin expression at control levels as shown by immunocytochemistry. DEX-Ac significantly increased IOP from days 3-44 ($n=23$, $p<0.0001$), with a maximum IOP increase of 10 mmHg compared to vehicle control eyes. GRβ transduction of TM at day 19 after DEX-Ac induced OHT significantly lowered IOP ($n=14$, $p<0.001$) within 7 days to baseline IOPs, thus reversing GC-OHT in mouse eyes. DEX-Ac significantly decreased the outflow facility ($n=10$, $p<0.01$), and GRβ transduction returned the outflow facility to normal levels ($n=9$, $p<0.05$). Increased expression of fibronectin and collagen I was observed in DEX-Ac treated mouse eyes compared to controls and GRβ transduced mouse eyes.

Conclusions: Overexpression of GRβ in the TM of mouse eyes reversed GC-OHT. GRβ gene therapy may be a useful therapeutic approach to treat GC-OHT and glaucoma.

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1012 - Poster **Classification:** GSBS Student

Presenter: Pinkal D. Patel **Department:** North Texas Eye Research Institute

Authors: Pinkal Patel, UNT Health Science Center; Ramesh Kasetti, UNT Health Science Center; Tien Phan, UNT Health Science Center; Prabhavathi Maddineni, UNT Health Science Center; Gulab Zode, UNT Health Science Center

A Small Chemical Chaperone, Sodium 4 Phenylbutyrate Inhibits TGFβ2-Induced ECM Remodeling in Human TM Cells

Purpose: The pathological mechanisms underlying increased outflow resistance at the trabecular meshwork (TM) that is responsible for elevating intraocular pressure (IOP) have not been fully delineated. We have previously shown that progressive accumulation of unfolded proteins and endoplasmic reticulum (ER) stress play an important role in the pathophysiology of glaucomatous TM damage in myocilin-associated POAG. However, it is not understood whether other glaucoma factors lead to similar pathological ER stress in the TM, leading to IOP elevation. Transforming growth factor β2 (TGFβ2) is known to induce abnormal extracellular matrix (ECM) deposition in the TM cells, which may be responsible for IOP elevation. Here, we examined whether TGFβ2 induces ER stress and whether reducing ER stress via a small chemical chaperone, sodium 4-phenylbutyrate (PBA) reduces TGFβ2–induced ECM remodeling.

Methods: Human GTM-3 cells or primary TM cells (n=2) were treated with TGFβ2 (5ng/ml) with or without 5mM PBA for 48 hours. Total cellular lysates, conditioned medium, and fixed cells were examined for ECM and ER stress markers by Western blotting and immunostaining. We also used RT-PCR to demonstrate XBP1 splicing in response to TGFβ2 treatment.

Results: TGFβ2 increased synthesis and deposition of ECM proteins in GTM-3 and primary TM cells. TGFβ2 induced ER stress as evident from increased ER chaperones and splicing of XBP-1. Treatment of TM cells with TGFβ2 and PBA demonstrated reduced synthesis and deposition of ECM and ER stress markers as evident from reduced fibronectin, GRP78, GRP94 and CHOP.

Conclusions: Our studies suggest that TGFβ2 induces abnormal ECM accumulation and ER stress, and PBA may reduce TGFβ2-induced IOP elevation by decreasing abnormal ECM accumulation and reducing ER stress.

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1013 - Poster **Classification:** GSBS Student

Presenter: Urmimala Raychaudhuri **Department:** North Texas Eye Research Institute
Authors: Urmimala Raychaudhuri, UNT Health Science Center; Cameron Millar, UNT Health Science Center; Abbot Clark, UNT Health Science Center

Tissue Transglutaminase Mediated Ocular Hypertension and Effects of a Small Molecule Crosslinking Modulator

Purpose: Transforming Growth Factor-β2 (TGF-β2) induces expression of the crosslinking enzyme tissue transglutaminase (TGM2) in human trabecular meshwork (TM) cells. We studied (1) whether TGM2 overexpression in the TM can increase intraocular pressure (IOP) and decrease aqueous humor (AH) outflow facility (C) in mice and (2) whether a small molecule TGM2 inhibitor can decrease ECM crosslinking in-vitro.

Methods: 2µl of the expression vector Ad5.CMV.TGM2 (1-50 × 10^6 pfu) was injected intravitreally (OS) in BALBc/J (n=18) or C57BL/6J mice (n=9), while contralateral eyes served as uninjected controls. Daytime conscious IOPs were measured (Tonolab) twice/week. C was measured following IOP elevation in BALBc/J (n=6) and C57BL/6J (n=3) mice. In vitro, primary human glaucoma TM cells (GTM 125, GTM 60 A and GTM 46) were treated with a small molecule TGM2 inhibitor (5nM).

Results: Ad5.CMV.TGM2 injection significantly elevated IOP, where BALBc/J showed maximum IOP at Day 19, [15.86 mmHg (injected) vs. 10.7 mmHg (control), ($p<0.0001$, ANOVA)] and C57BL/6J showed maximum IOP at Day 17 [(17.09 mmHg (injected) vs. 12.01 mmHg (control), ($p<0.05$)]. In BALBc/J, C in transduced eyes (0.013 µl/min/mmHg) was significantly lower than uninjected eyes (0.021 µL/min/mmHg), $p = 0.01$, paired Student's t-test. In C57BL/6J, C in injected eyes (0.012 µl/min/mmHg) was significantly lower than uninjected eyes (0.019 µL/min/mmHg), $p = 0.046$, paired Student's t-test. In GTM cells, primary GTM cells showed high endogenous ECM crosslinking, and treatment with a TGM2 inhibitor (5nM) reduced fibronectin expression and crosslinking but did not affect TGM2 expression as seen with immunocytochemistry and western immunoblotting.

Conclusions: TGM2 overexpression in the mouse TM significantly elevates IOP and decreases the AH outflow facility. A TGM2 inhibitor decreased crosslinking in TM primary cells. In future, we will study the role of TGM2 and the TGM2 small molecule inhibitor in TGFβ2 induced ocular hypertension.

Sponsor: N/A
IRB/IACUC#: 2015-0002

1014 - Poster **Classification:** GSBS Student

Presenter: Amanda Lenell Roberts **Department:** Biomedical Sciences

Authors: Amanda Roberts, UNT Health Science Center; Humberto Hernandez, UNT Health Science Center; Stacy Curry, UNT Health Science Center; Colleen McDowell, UNT Health Science Center

Crosstalk Between TGFβ2 and TLR-4 Signaling Pathways in the Glaucomatous Trabecular Meshwork

Purpose: Glaucoma is a heterogeneous group of optic neuropathies that increases extracellular matrix (ECM) proteins in the trabecular meshwork (TM) and leads to thinning of the retinal nerve fiber layer and vision loss. TM regulates aqueous humor outflow and intraocular pressure (IOP). In this study, we employ experimental cell culture methods to determine whether the crosstalk between transforming growth factor beta 2 (TGFβ2) and toll-like receptor 4 (TLR4) signaling pathways regulate ECM production. We hypothesize that TGFβ2-TLR4 crosstalk is a pathway that assist TLR4 ligands to augment TGFβ2 signaling and regulate ECM production in the TM.

Methods: Transformed human TM (GTM3) and primary human TM (HTM) cells were grown to confluency. Cells were pre-treated with TAK-242 for 2 hours followed by treatment of TGFβ2 for 24 hours (RNA) or 48 hours (protein). To activate TLR4, HTM cells were plated on dishes pre-coated with cellular fibronectin (cFN) containing the FN-EDA isoform in the presence or absence of TGFβ2. ECM expression was assessed by western immunoblotting and quantified by densitometry.

Results: These experiments revealed a TGFβ2-TLR4 signaling crosstalk that regulates ECM production. TGFβ2 treatment in GTM3 cells enhanced fibronectin (FN) and collagen-1 mRNA expression and FN protein expression in the condition medium and cell lysate, while TAK-242 significantly blocked this effect. Activating TLR4 using cFN-EDA alone increased FN expression in HTM3 cells. TGFβ2 with cFN-EDA treatment significantly enhanced FN expression compared to TGFβ2 alone. TLR4 inhibitor TAK-242 significantly blocked TGFβ2 and cFN-EDA induced ECM changes. For future studies, I will use low molecular weight hyaluronan (LMWH) as a TLR4 activator. I expect the LMWH to enhance the effect of TGFβ2 induced ECM production.

Conclusions: These studies identified TGFβ2-TLR-4 crosstalk as a novel pathway involved in ECM regulation in the TM. These data provide novel targets to further explore the molecular mechanism involved in glaucomatous TM development.

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1015 - Poster **Classification:** Faculty (Not for Competition)

Presenter: Dorota L. Stankowska **Department:** North Texas Eye Research Institute

Authors: Dorota Stankowska PhD, UNT Health Science Center; Raghu Krishnamoorthy PhD, UNT Health Science Center; Sruthi Sampathkumar, Case Western Reserve University; Ram Nagaraj, University of Colorado School of Medicine

An Antiapoptotic Peptide for Neuroprotection in Glaucoma

Purpose: Axonal degeneration and death of retinal ganglion cells (RGC) are primary contributors to vision loss in glaucoma. The purpose of this study was to determine if intraperitoneal administration of the core peptide derived from small heat shock protein αB-crystallin (ABCP) could inhibit RGC death in animal models of glaucoma.

Materials and Methods: Brown Norway rats were retrogradely labeled (to detect RGCs) using Fluoro-gold and IOP was elevated (150 mmHg/days) in one eye using the Morrison's method, while the contralateral eye served as control. The rats were intraperitoneally injected with 10µg of ABCP (n=3 animals per group) three times per week for five weeks. Surviving RGCs were counted in retinal flat mounts. In another model of ischemia reperfusion (I/R) injury, C57BL/6 mice were subjected to IOP elevation of 120 mmHg for 30 min, followed by rapid reperfusion. Intraperitoneal ABCP injections were given 3h before and immediately after the procedure and then once daily post I/R injury for 14 days. RGC apoptosis was assessed using a TUNEL assay (n=2 animals per group).

Results: Intraperitoneal injections of ABCP significantly ($p<0.05$) inhibited RGC death in the Morrison's model of glaucoma in rats following five weeks of IOP elevation. The ratio of Fluoro-gold labelled RGCs [IOP elevated (L) to contralateral eyes (R)] in scrambled (control) peptide injected animals was 0.76±0.09 in comparison with ABCP treated rats with the ratio of 1.17±0.11. Intraperitoneally injected ABCP also prevented RGC apoptosis, measured after 14 days following the I/R injury in mice. There were significantly ($p < 0.05$) fewer TUNEL positive RGCs detected in the RGC layer of I/R mice retinas treated with ABCP (5%) in comparison with those injected with the scrambled peptide (28%).

Conclusions: Intraperitoneally administered ABCP peptide was able to significantly attenuate RGC death in two animal models of glaucoma. These findings suggest that ABCP has the potential to be developed as a neuroprotective agent in glaucoma.

Sponsor: N/A
IRB/IACUC#: IACUC-2016-0030

1017 - Poster **Classification:** GSBS Student

Presenter: Hannah Webber **Department:** North Texas Eye Research Institute
Authors: Hannah Webber, UNT Health Science Center; Weiming Mao, UNT Health Science Center; Abbot Clark, UNT Health Science Center

Effects of Wnt/beta-catenin and SMAD/TGF-beta Crosstalk on Cadherins in the Trabecular Meshwork

Purpose: We have shown cross-inhibition of the primary open angle glaucoma (POAG)-associated Wnt/beta-catenin and SMAD/TGFb signaling pathways in trabecular meshwork (TM) but the downstream effects of this crosstalk are unknown. Wnt transcription factor and cadherin accessory protein, beta-catenin, plays a role in cadherins junction stability. We studied the role of Wnt/beta-catenin and SMAD/TGFb signaling on cadherins junctions in the TM and TM cell adhesion.

Methods: Confluent primary TM (NTM) cells (donated from Alcon) were treated for 2 or 24 hours with or without 100ng/mL Wnt3a or 5ng/mL TGFb2 and their membrane-bound protein, conditioned media, and total protein were isolated for western immunoblotting. Samples were probed for fibronectin (FN), PAI-1, p-Smad3, beta-catenin, GAPDH, Pan-, K-, or OB-cadherin. Some NTM cells were grown to 80% confluence then transfected with 0.3nM or 0.5nM K-cadherin, OB-cadherin, or non-targeting siRNA. Forty-eight or 72 hours after transfection, cells were harvested for western immunoblotting or immunofluorescence. NTM cells were plated for the Acea iCelligence system to determine cellular impedance with data collected every 30 minutes to establish baseline. After 24 hours, culture medium was replaced with transfection mixes as described. Cell impedance was continuously measured for an additional 96 hours. Bright field images of the cells were taken.

Results: Wnt3a treatment resulted in increased K-cadherin expression. Co-treatment of Wnt3a and TGFb2 decreased the expression of K-cadherin. Three days after transfection with 0.5nM K-cadherin siRNA, decreased K-cadherin expression was observed in both whole cell lysate and membrane-bound fractions. Transfection with K-cadherin siRNA decreased NTM cellular impedance compared to non-targeting siRNA control.

Conclusions: Crosstalk between Wnt/beta-catenin and SMAD/TGFb signaling pathways in the TM may regulate the expression of cadherins as well as NTM cell adhesion.

Sponsor: NIH training grant T32 AG 020494
IRB/IACUC#: 2016-094

Forensic and Investigative Genetics (Abstracts in the 1100s)

1100 - Poster **Classification:** GSBS Student
Presenter: Kelcie Thorson **Department:** Forensic and Investigative Genetics
Authors: Kelcie Thorson, UNT Health Science Center; Roxanne Zascavage, UNT Health Science Center; John Planz, UNT Health Science Center

Approaches to Mitochondrial Genome Sequencing Using the Oxford Nanopore MinION Device

Purpose: Current DNA sequencing methods rely on polymerase chain reaction (PCR) to create an abundance of copies of targeted regions of DNA to serve as a library. PCR and subsequent clean-up steps add considerable time and cost to the process and provide opportunity for amplification errors or contamination to be introduced. The aim of this study is to develop an accurate and effective method for mitochondrial genome (mtGenome) sequencing that does not require PCR enrichment. Our hypothesis was that results generated from native DNA sequencing would be concordant and of comparable quality to sequencing results generated from PCR-enriched libraries.

Methods: We evaluated full mtGenome sequences generated on the MinION device from fourteen blood samples and two NIST-traceable control samples using two sequencing approaches. To assess effectiveness, the full mtGenome was amplified using in-house developed, long-range PCR enrichment that generated nine overlapping amplicons. Amplicons were normalized, combined and ligated to barcoded sequencing adaptors allowing for concurrent sample processing. Nanopore sequencing accuracy was assessed through comparison to two NIST-traceable samples for which the mitochondrial DNA (mtDNA) sequence is certified. MinION output was processed using a cloud-based basecaller. The resultant FAST5 files were analyzed with a custom data pipeline. Sequence files generated from amplified mtDNA libraries were segregated by barcode and aligned to the revised Cambridge Reference Sequence (rCRS). Pile-ups of strand data were individually assessed for sequence coverage and accuracy. A consensus sequence and variant report was created for each sample. For comparison, genomic DNA from each of the 16 samples was sequenced on the MinION device following adaptor ligation. mtDNA sequence data generated from genomic MinION sequencing were informatically extracted from total library output through direct alignment to rCRS and further analyzed in same manner as amplified samples. Consensus sequences generated for each method were aligned and identity/continuity were assessed. Inconsistencies were evaluated to determine whether there were errors in sequencing or artifacts generated by the specific analysis method.

Results: Our data indicate the PCR-free libraries sequenced on the MinION yields results concordant with PCR-enriched libraries.

Conclusions: This lays the groundwork for Nanopore technology for future research with forensic markers.

Sponsor: National Institute of Justice Award 2015-DN-BX-K068
IRB/IACUC#: IRB 2010-106

1101 - Poster **Classification:** GSBS Student

Presenter: Rachel Wiley **Department:** Graduate School of Biomedical Sciences

Authors: Rachel Wiley, UNT Health Science Center; Xiangpei Zeng, UNT Health Science Center; Bobby LaRue, Sam Houston State University; Harrell Gill-King, UNT Health Science Center; Bruce Budowle, UNT Health Science Center

Evaluation of the Parabon® Snapshot™ DNA Phenotyping System

Purpose: DNA phenotyping, a relatively new area of forensic genetics, predicts a person's ancestry and physical appearance (phenotype) from a DNA sample, by typing an array of single nucleotide polymorphisms (SNPs). The Parabon® Snapshot™ DNA Phenotyping System purports to predict detailed biogeographic ancestry (global and regional), sex, skin pigmentation, eye color, hair color, freckling, and face morphology in a single analysis.

Methods: To assess the performance of this system, the University of North Texas Health Science Center recruited 24 individuals, representing phenotypic and ancestral diversity, to participate in a small blind study. Self-reported ancestry and phenotypes were collected and photographs were taken of each subject for subsequent comparison with the predictions generated. Twenty-five (25) DNA samples were sent anonymously to Parabon for Snapshot analysis. One sample was purposefully prepared as a mixture of two subjects. This sample manipulation was not made known to Parabon. Each DNA sample was genotyped and processed through the Snapshot prediction algorithms. All composites were generated at age 25 with a body mass index (BMI) of 22. Age and BMI targets were provided to Parabon subsequent to the blind analysis predictions, and composites for two subjects were blindly progressed by a Parabon forensic artist. Facial morphology predictions were compared to standardized craniofacial anthropologic measurements reported in the literature for each corresponding population.

Results: The sex and bioancestry predictions for all participants were consistent with their self-reported classifications. Skin pigmentation predictions were relatively consistent within and among population groups for our sample set; 100% for Europeans (n=11) and 92% for non-Europeans (n=13). European eye and hair color predictions were 91% and 82% consistent, respectively.

Conclusions: No conclusions were made regarding Snapshot's performance for the prediction of facial morphology due to 1) the small sample size, 2) features used by Snapshot did not translate to those used by anthropologists, and 3) more anthropological data are needed. Although a small sample size, the results support that the majority of external feature phenotype and bioancestry predictions made with Snapshot are consistent with donor self-declaration and the Evaluators. A more thorough analysis is needed to assess Snapshot's capacity to predict face morphology.

Sponsor: Supported in part by the National Geographic Society
IRB/IACUC#: 2015-190

General Medicine (Abstracts in the 1200s)

1200 - Poster **Classification:** School of Health Professions Student
Presenter: Margaret Landon **Department:** Physician Assistant Studies
Authors: Shannon Bernbaum, UNT Health Science Center; Margaret Landon, UNT Health Science Center; Kelsey Rice, UNT Health Science Center; Steven C. Whitney, UNT Health Science Center; Jessica Hartos, UNT Health Science Center

Is Weight Status a Risk Factor for Depression in Young Adult Females?

Introduction: Depression and obesity are prevalent and growing in the general population, and this poses a serious concern for the healthcare system (1,2). An association between depression and obesity has been demonstrated in the general population (3,4,5,6), but there has been little research on the association in young females. The purpose of this study was to determine if weight status is a risk factor for depression in females aged 18-24.

Methods: This cross-sectional study used 2014 BRFSS data on females aged 18-24 from Maine, Missouri, Montana, and Vermont. Multiple logistic regression analysis was used to determine the relationship between weight status and depression while controlling for ethnicity/race, marital status, education level, employment status, and income level.

Results: Most of the participants reported they had never received a diagnosis of depression or dysthymia in their lifetime (74-76%), and the majority reported they were not overweight or obese (58-66%). After controlling for psychosocial and demographic factors, depression was significantly related to weight status (large effect sizes) in Maine and Missouri.

Conclusions: Weight status was related to depression in two of four states in young adult females. These findings may be generalizable to primary care, but the association may be different in specialty practice. A temporal relationship between weight status and depression could not be determined from the cross-sectional data. It is recommended that practitioners screen for depression criteria in overweight and obese female young adults only if the patients present with signs and symptoms of depression.

Sponsor: N/A
IRB/IACUC#: 2016-074

1201 - Poster **Classification:** School of Health Professions Student
Presenter: Madi Escamilla **Department:** Physician Assistant Studies
Authors: Amairany Escamilla, UNT Health Science Center; Midhat Syed, UNT Health Science Center; Dallah Abdallahi, UNT Health Science Center; Julia Reynolds, UNT Health Science Center; Jessica Hartos, UNT Health Science Center

For General Health, Do COPD Rates Differ By Ethnicity/Race In Women 50-85 Years Old?

Purpose: Chronic obstructive pulmonary disease (COPD) is a diagnosis with increasingly significant public health and economic implications, but there is limited research exploring racial and ethnic differences in COPD rates among genders. Therefore, the purpose of this study was to assess whether COPD rates differ by ethnicity/race in women 50-85 years old.

Methods: This cross sectional analysis used 2014 BRFSS data for females 50 years and older from Alabama, Arkansas, Kentucky, and West Virginia. Multiple logistic regression analysis was used to assess the relationship between COPD and ethnicity/race while controlling for asthma, tobacco use, education level, employment status, income level, and healthcare access.

Results: Few women 50 to 85 years old reported COPD (15-18%), most were white (73-95%), less were black (2-24%), and only a few were of "other" ethnicity/race (3-4%). After controlling for psychosocial and demographic factors, African Americans were about 2 to 3 times less likely to report COPD than other races in Alabama, Arkansas, and Kentucky. Additionally, COPD was significantly related to asthma, employment status, and tobacco use across all states.

Conclusions: COPD was significantly related to ethnicity/race across three states (Alabama, Arkansas, and Kentucky), and it was related to asthma, employment status, and tobacco use across all states in samples representative of females 50 to 85 years old. Due to the cross sectional nature of the study, comorbidities and the progression of COPD were not accounted for. Nevertheless, screening African Americans for COPD in primary practice is recommended if the patient presents with indicating symptoms. Moreover, primary care clinicians should always educate and screen all patients with a history of tobacco use or asthma for COPD.

Sponsor: N/A
IRB/IACUC#: 2016-074

1202 - Poster **Classification:** Resident

Presenter: Juan M Flores Jr **Department:** Family Medicine

Authors: Juan Flores Jr, Medical City Fort Worth (Plaza Medical Center); Kimberly Fulda Jr, UNT Health Science Center; Susan Franks, UNT Health Science Center; Shane I. Fernando PhD MS, UNT Health Science Center

Spanish Primary Language As A Risk Factor For Pre-Hypertension in Mexican-American Children and Adolescents

Background: One-third of American adults have metabolic syndrome, which includes high blood pressure and other factors associated with increased risk of heart disease, diabetes mellitus, and stroke. Mexican-Americans have the highest age-adjusted prevalence (31.9%) of metabolic syndrome. A preliminary study showed children who spoke Spanish in the home had a decreased risk for diabetes mellitus as compared to children who spoke English in the home. Pre-hypertension during adolescence is associated with increased risk of hypertension in adulthood, but studies showing its association to acculturation have not been done.

Hypothesis: Having Spanish as the primary language at home is associated with lower odds of having pre-hypertension among Mexican-American adolescents.

Methods: Mexican-American participants, ages 10-14 and a parent/legal guardian were enrolled. Participants were recruited from NorTex family medicine clinics and community events. Clinical measures were collected including blood pressure (average of two readings) and presence of Acanthosis Nigricans. Primary language spoken (English, Spanish, both English and Spanish) in the home, gender, and age were also measured. Simple and multiple logistic regressions were performed with pre-hypertension (yes/no) as the outcome variable and primary spoken language and presence of Acanthosis Nigricans as the primary predictors. The adjusted model controlled for the participant's age and gender.

Results: Participants (N=144) were 48.6% female, and the mean age was 11.97 (sd=1.44). Twenty-four (16.7%) participants had elevated blood pressure levels consistent with pre-hypertension. Sixty-nine (47.6%) participants had Acanthosis Nigricans. Responses for primary language were 32 (22.2%) English, 84 (58.3%) Spanish, and 28 (19.4%) English and Spanish. There was no association between primary language spoken in the household and pre-hypertension. Presence of Acanthosis Nigricans was associated with an increased odds of being pre-hypertensive [OR=6.07; 95% CI: (2.04-18.06)].

Conclusions: Speaking Spanish in the home was not associated with prehypertension; however, there was an association between presence of Acanthosis Nigricans and pre-hypertension. Acanthosis Nigricans is a physical exam finding of hyperpigmentation of skin folds associated with insulin resistance. The relationship of Acanthosis Nigricans and pre-hypertension is likely an early sign of metabolic syndrome in adolescents. Further research into this relationship may provide more answers.

Sponsor: N/A
IRB/IACUC#: 2012-151

1203 - Poster **Classification:** School of Health Professions Student
Presenter: Norin Hooda **Department:** Physician Assistant Studies
Authors: Norin Hooda, UNT Health Science Center; Jill Sanford, UNT Health Science Center; Alexa Curry, UNT Health Science Center; Alexandra Hung, UNT Health Science Center; Jessica Hartos, UNT Health Science Center

Is Weight Status Related to Depression in Young Adult Females?

Introduction: Clinical depression is prevalent in young adult females in the U.S. and leads to physical and psychosocial illness and mortality. While many risk factors for depression have been previously studied, little information is available on the relationship between depression and weight status in young adult females. Thus, the purpose of this study was to assess the relationship between depression and weight status in young adult women.

Methods: This cross-sectional analysis used 2014 BRFSS data for females of ages 18 to 35 from Arkansas, Oregon, Alabama, and Oklahoma. Multiple logistic regression analysis was used to assess the relationship between depression and being overweight while controlling for ethnicity/race, education level, employment status, income level, exercise, and tobacco use.

Results: Few participants reported ever being diagnosed with any form of depression or dysthymia (22-32%) and the majority of participants reported being overweight (47-64%). After controlling for psychosocial and demographic factors, depression was not significantly related to weight status in Arkansas, Oregon, Alabama, or Oklahoma. Depression was significantly related to high income (large effect sizes) in Alabama and Oklahoma.

Conclusions: In general population samples of young adult females, few reported depression, and the majority reported being overweight, but depression was not related to weight status. However, depression was related to income level. Limitations to this study include inability to assess the relationship over time and self-reported data with the possibility of inaccuracy. It is recommended that primary care practitioners become informed, screen, and educate their young adult female patients on depression and weight status independently due to an abundance of adverse effects. However, due to the absence of a relationship between the two conditions, it is not indicated that practitioners evaluate one due to the presence of another.

Sponsor: N/A
IRB/IACUC#: 2016-074

1204 - Poster **Classification:** TCOM DO Student
Presenter: Stephanie Kinsley **Department:** Surgery
Authors: Stephanie Kinsley, UNT Health Science Center; Lisa Nash, UNT Health Science Center

Cutaneous Endometrioma in a 26-year-old Female with Abdominal Pain

Objective: To describe a case of cesarean scar endometriosis presenting as abdominal pain, and review literature for signs and symptoms that may allow prompt diagnosis and treatment.

Materials and Methods: N/A

Summary: Endometriosis is defined as the growth of functional endometrial tissue outside of the uterine cavity. The primary difficulty in diagnosing endometriosis is due to its variable presentation, causing a delay in treatment and management. The present study describes a case of cesarean scar endometriosis presenting as abdominal pain, and reviews literature for signs and symptoms that may allow prompt diagnosis and treatment. A 26-year-old female presented to her primary care physician with complaints of abdominal pain for two months, and was ultimately referred to the general surgeon for evaluation. Physical exam revealed a a tender, palpable, soft tissue mass deep to her lower midline scar, and CT scan revealed a 1.8cm x1.8cm fluid-filled area in the anterior midline of the abdomen inferior to the umbilicus. The mass was surgically excised, and pathology findings were consistent with cutaneous endometriosis. Cutaneous endometriosis should be suspected in a female of childbearing age presenting with a tender, painful mass, associated with a previous gynecological scar. Definitive diagnosis is made histologically, and treatment is surgical excision with follow-up.

Conclusions: Cutaneous endometriosis should be suspected in a female of childbearing age presenting with a tender, painful mass, associated with a previous gynecological scar. Definitive diagnosis is made histologically, and treatment is surgical excision with follow-up.

Sponsor: N/A
IRB/IACUC#: 2017-022

1205 - Poster **Classification:** School of Health Professions Student
Presenter: Wendy Martinez **Department:** Physician Assistant Studies
Authors: Wendy Martinez, UNT Health Science Center; Tarjani Mehta, UNT Health Science Center; Katherine Schmidt, UNT Health Science Center; Patrick Feeney, UNT Health Science Center; Jessica Hartos, UNT Health Science Center

Is Obesity a Risk Factor for COPD in Females Ages 55 and Older?

Purpose: Research has shown a relationship between COPD and weight status; however, the information was not specific to a gender or age groups. Thus, the purpose of our study is to determine whether obesity is a risk factor for COPD in females who are 55 years and older.

Methods: This cross sectional analysis used data from the BRFSS 2014 survey for females aged 55 and older from Alabama, Kentucky, Oklahoma, and Ohio. Multiple logistic regression analyses was used to assess the relationship between obesity and COPD, while controlling for age, race/ethnicity, asthma, diabetes, exercise, heart disease, and tobacco use.

Results: Few of the target population reported having lifetime diagnosis of COPD (15-18%) and the majority reported being obese (67-70%). After controlling for demographic factors, COPD was significantly related to obesity in Oklahoma (small effect size), and significantly related to exercise (small effect sizes), heart disease (moderate effect sizes), tobacco use (moderate effect sizes) and asthma (large effect sizes) in all four states.

Conclusions: The majority of the states found that obesity was not related to COPD in females aged 55 and older. However, asthma, exercise, heart disease, and current smoking were significant in all states. A limitation to this study was that it lacked information on COPD severity and history. Primary care providers should screen and educate patients with COPD symptoms for tobacco use, heart disease, and lack of exercise. Providers should also screen, educate, and refer for obesity as necessary.

Sponsor: N/A
IRB/IACUC#: 2016-074

1206 - Poster **Classification:** Faculty (Not for Competition)
Presenter: Susan Matthew **Department:** Family Medicine
Authors: Susan Matthew, UNT Health Science Center; Stephanie Large, UNT Health Science Center; Long Wong M.D. Ph.D, UNT Health Science Center

How Primary Care Manages the Patient with Acute Chest Pain

Objective: Chest pain is a common complaint among primary care patients. Primary care clinics are limited in their ability to differentiate acute cardiac chest pain from chest pain due to other causes. This is a case analysis exploring the management of a primary care patient with chest pain from clinic to emergency room treatment to return office visit.

Methods: Case analysis of a primary care patient. The electronic health record was used to obtain information from the clinic visits and the emergency room records.

Results: The primary care patient went to the emergency room for acute chest pain and was diagnosed with anxiety.

Conclusions: Primary care providers should use a combination of chest pain algorithms, clinical assessment tools, electrocardiograms and clinical judgment. Even with these tools it remains difficult to predict the outcomes of primary care patients who present to clinics with acute chest pain.

Sponsor: N/A
IRB/IACUC#: 2017-006

1207 - Poster **Classification:** SPH Student

Presenter: Oluwatimilehin Okunowo **Department:** Epidemiology
Authors: Oluwatimilehin Okunowo, UNT Health Science Center; Grace Negedu, UNT Health Science Center; Jenny Lee PhD, MPH, CHES, UNT Health Science Center

Epigenetics Evidence to Advance Utility of Multifaceted Lifestyle Interventions in Primary Care Practice: The Lessons from a Targeted Review

Background: Epigenetics is a science that deals with the impact of environmental factors and lifestyle on healthful or pathological alterations in epigenetic processes. Primary care providers (PCPs) may need to redefine their roles in health care that requires lifestyle counseling or coaching on healthy lifestyle choices, and prescribing behavioral interventions to tackle lifestyle related chronic diseases. The knowledge of epigenetics can motivate PCPs to incorporate multifaceted lifestyle intervention practices in their clinical encounters with patients to improve their health outcomes.

Objectives: The objectives of this study are: 1) to explore the relationship between epigenetics and multiple dimensions of lifestyle and environmental factors; and 2) discuss the implication of epigenetics knowledge driven multifaceted lifestyle interventions in primary care practice.

Methods: A targeted search was carried out on articles published in English from MEDLINE over an 11 year period, from January 1st, 2005-December 31st, 2016, with a focus on seven selected categories of lifestyle dimensions (spiritual, intellectual, emotional, physical, social, occupational, and environmental), and the corresponding lifestyle interventions commonly used in patient care.

Results: The study identified a large base of literature (11,500 articles) connecting epigenetics to the various components of lifestyle factors. The percentage of articles found on the various lifestyle categories varied significantly - spiritual (1%), intellectual (4%), emotional (40%), physical (24%), social (8%), occupational (5%) and environmental (19%). 927 articles were also investigated for epigenetic effects driven by lifestyle interventions. A causal and effect relationship between lifestyle and epigenetics was highly observed in emotional and physical lifestyle dimensions.

Conclusions: Generally, Epigenetics modification occurred in response to the multidimensional lifestyle factors reviewed in this study. This evidence would improve knowledge, attitudes, and approaches PCPs use in their clinical encounters with patients suffering from lifestyle-associated chronic diseases. Integrating epigenetics knowledge may advance the use of a multifaceted lifestyle intervention approach in primary care practice to address chronic diseases.

Sponsor: N/A
IRB/IACUC#: N/A

1208 - Poster **Classification:** TCOM DO Student

Presenter: Azaan Ramani **Department:** Family Medicine

Authors: Azaan Ramani, UNT Health Science Center; Stephanie Nguyen, UNT Health Science Center; Long Wong, UNT Health Science Center

Complications in the Management of Pulmonary Arterial Hypertension: A Case Report

Background: Pulmonary arterial hypertension (PAH) is a rare but highly lethal condition characterized by progressive elevation of pulmonary pressures and vascular remodeling. Etiologies of PAH are multifactorial including idiopathic, secondary to chronic conditions, and most importantly genetics. Recent research has identified multiple genes that lead to the manifestation of this condition. It is a difficult condition to manage as patients present with a multitude of co-morbid conditions. Much of the issues involve the cardiovascular and pulmonary systems, which progressively worsen if left untreated. Perioperative complications rates also increase after surgery, including increase in morbidity and mortality. Significant advances have been made in the management of PAH, including treatments that target the vascular remodeling.

Purpose: We present the case of a 33-year-old female who presents with pulmonary arterial hypertension and aim to highlight the challenges in management and treatment of this patient.

Methods: N/A

Results: N/A

Conclusions: Physicians and medical students will encounter patients on various treatments for PAH. Providers should remain aware of the latest treatment and management to improve morbidity and mortality in patients with PAH.

Sponsor: N/A
IRB/IACUC#: 2017-008

1209 - Poster **Classification:** Resident

Presenter: Abraham E. Rodriguez **Department:** TCOM GME Programs
Authors: Abraham Rodriguez, UNT Health Science Center; Lisa Nash, UNT Health Science Center; Stephanie Digiovanni, UNT Health Science Center

Intractable Hypokalemia in a Patient with Ogilvie's Syndrome

Background: Ogilvie's syndrome or colonic pseudo-obstruction, is a life-threatening condition that can result from severe illness or surgery. This case study illustrates a patient who was found to have concomitant intractable hypokalemia despite aggressive medical treatment. The patient required multiple therapeutic interventions, ultimately achieving resolution of the pseudo-obstruction by cecostomy tube placement.

Results/Conclusions: The patient's hypokalemia resolved quickly after surgery and remained within normal limits for the remainder of the hospital course. This case report discusses colonic pseudo-obstruction as well as the pathophysiology of concomitant hypokalemia.

Sponsor: N/A
IRB/IACUC#: 2017-023

1210 - Poster **Classification:** School of Health Professions Student
Presenter: Hannah Turner **Department:** Physician Assistant Studies
Authors: Hannah Turner, UNT Health Science Center; Ivonne Grabow, UNT Health Science Center; Katelynn Faulk, UNT Health Science Center; William Morgan, UNT Health Science Center; Kimberly Meyer, UNT Health Science Center; Jessica Hartos, UNT Health Science Center

Is Diabetes a Risk Factor for Stroke in Women Ages 45-54?

Introduction: Diabetes has been identified as a risk factor for stroke. However, there is little known about the relationship between stroke and diabetes by gender and specific age groups. The purpose of this study was to assess whether diabetes is a risk factor for stroke in women ages 45-54.

Methods: This cross-sectional analysis used 2014 BRFSS data for females ages 45-54 in Arkansas, Kentucky, Maryland, South Carolina, and West Virginia. Multiple logistic regression was used to assess the relationship between stroke and diabetes, while controlling for alcohol use, education level, ethnicity/race, exercise, tobacco use, and weight status.

Results: Few women ages 45-54 reported ever being diagnosed with stroke (3-6%) or diabetes (10-17%). After controlling for alcohol use, education level, ethnicity/race, exercise, tobacco use, and weight status, diabetes was significantly related to stroke in Kentucky (AOR=2.92, 95% CI=1.40, 6.09) and Maryland (AOR=3.32, 95% CI=1.07, 10.3) but not in Arkansas, South Carolina, and West Virginia.

Conclusions: Diabetes was found to be significantly related to stroke in two out of five states. This cross-sectional study does not reflect previous history of stroke and diabetes or their comorbidities. Since this data was from a population-based study, the results may reflect patients in the primary care setting. Therefore, practitioners in primary care can expect to see a very low percentages of stroke and diabetic patients and may consider screening for diabetes or stroke in patients with signs and symptoms of either disease.

Sponsor: N/A
IRB/IACUC#: 2016-074

1211 - Poster **Classification:** TCOM DO Student
Presenter: Emily Zangla **Department:** Non UNTHSC
Authors: Emily Zangla, UNT Health Science Center; Jane Keng, Cook Children's Medical Center; Nicholas Ogunmola M.D., Cook Children's Medical Center; Crystal M. O'Reilly R.N., Cook Children's Medical Center; Jose Gonzalez M.D., Cook Children's Medical Center; Luke Hamilton M.S., Cook Children's Medical Center; Don P. Wilson M.D., FNLA, Cook Children's Medical Center

Evaluating the Diagnostic Criteria for NAFLD

Purpose: Nonalcoholic Fatty Liver Disease (NAFLD) is the most prevalent chronic liver disease in American children and adolescents, thought to involve hepatic fat deposition and inflammatory changes secondary to insulin resistance.

Methods: Diagnosis is currently based on elevated ALT levels and subsequent liver ultrasound. Ultrasound, however, has proven to be less accurate in pediatrics than adults. Due to these limitations of utilizing ultrasound, liver biopsy remains the gold-standard of NAFLD diagnosis on children. Although biopsy is the most definitive diagnostic method, non-invasive biomarkers need to be further investigated for their diagnostic value to children. A retrospective chart review was completed to describe the clinical parameters of patients with NAFLD.

Results: 45 patients (56% male) had a primary diagnosis relating to NAFLD; mean age 9.8 years (range 0–18 years). Mean BMI percentile was 84% (90% males; 79% females). Median ALT 79; 82.5 males; 79 females; range 25–1823 (ref 7–55 U/L males; 7–45 U/L females). Median AST 59; 60 males; 55 females; range 18–2353 (ref 8–60 U/L males 1–13 years; 8–50 females 1–13 years). These results allow us to study the profile of patients evaluated for NAFLD at Cook Children’s.

Conclusions: A better understanding of the criteria used by physicians can potentially help with early identification, prevention of disease progression, and improve care of children with NAFLD.

Sponsor: N/A
IRB/IACUC#: CCHCS IRB 2014 058

General Public Health (Abstracts in the 1300s)

1300 - Poster **Classification:** SPH Student
Presenter: Adebola Adeyemi **Department:** Environmental & Occupational Health
Authors: Adebola Adeyemi, UNT Health Science Center; Rasheedat Sadiq- Onilenla, UNT Health Science Center; Catharine Otakore, UNT Health Science Center; Matthew Moncus, UNT Health Science Center; Maya Nair, UNT Health Science Center

Laser Program Implementation in the University of North Texas Health Science Center Environmental Health and Safety Department

Purpose: Safety is an important feature of a higher education system because it helps to prevent employee exposure to occupational and environmental risk while performing daily task. There is an existing safety program in the university which is made up of three crucial components: policy, training and auditing. Due to constant change in research experiments, there is a need for evaluation and improvement of the program to accommodate those changes. The purpose of this research is to improve the existing higher education safety program and accommodate changes in the manual with emphasizes on laser safety.

Methods: Unscheduled laboratory inspection was carried out in all the laboratories in the key buildings on campus to examine safety practices. A couple of deficiencies were identified during the inspection. The data collected were compiled and analyzed using Excel software.

Results: The result from the analysis and from reviews of policies from state regulatory agencies and safety manual from other higher institutions in Texas showed a couple of deficiency in the area of program specific manuals in the Laser safety area. There are a couple of laboratories that uses class 3b and 4 lasers. Currently the laser safety is covered under the general radiation safety program.

Conclusions: The result of the study justifies the need for a Laser Safety Program. Adding the laser safety programs will help to improve the overall safety program of the institution and ensure compliance while working with laser. Based on this recommendation, a Laser Safety Manual was compiled for the proposed laser safety program. I recommend that periodic training should be conducted. Also, I recommend that routine audits of laser use activities should be conducted to assess the program.

Sponsor: N/A
IRB/IACUC#: N/A

1301 - Poster **Classification:** GSBS Student

Presenter: Hijab Ahmed **Department:** Graduate School of Biomedical Sciences

Authors: Hijab Ahmed, UNT Health Science Center; Shlesma Chhetri, UNT Health Science Center; Leeshia Crayton, UNT Health Science Center; Scott Walters, UNT Health Science Center; Emily Spence-Almaguer, UNT Health Science Center

Details and Deadlines: What Predicts Health Goal Completion Among Residents of Permanent Supportive Housing?

Background: Permanent Supportive Housing (PSH) is an intervention designed to solve chronic homelessness in the United States and includes supportive services to assist people with living independently. In Tarrant County, these services are augmented by m.chat, a health coaching program that is intended to improve the overall quality of life of PSH residents. Participants meet monthly with health coaches to establish health and wellness goals which are are documented using an online health coaching program.

Purpose:This study examined the association between different "SMART" (Specific, Measurable, Attainable, Realistic and Time-limited) characteristics and goal completion among m.chat participants.

Methods:There were 329 participants with 1057 recorded goals over the intervention period. We excluded inactive goals, and data from the first and last three months of the participant's involvement. Each goal was coded based on SMART traits using a binary choice (0 and 1 for absence or presence of trait, respectively). The outcome of interest was goal completion status (completed vs. active).

Results: Participants were almost equally divided between females (51%) and males (49%). The mean age was 52 years. Descriptive tests revealed that 73% of goals were specific and measurable and 21.5% of goals were time-limited. The characteristics of being attainable and realistic lacked variability and were not included in further analysis. At the participant's most recent coaching visit, 30% of the goals were completed and 70% were still active. Out of active goals, 70.5% were specific and measurable and of the completed goals, 78.9% were specific and measurable (Chi square p=0.005). Likewise, of active goals, 19.3% goals were time-limited compared to 26.5% of completed goals that were time-limited (Chi square p=0.009). Logistic regression revealed that the odds of specific and measurable goals being completed was 46% higher than those not specific and measurable (p=0.023). Similarly, the odds of timely goals being completed was 39% higher compared to non-time limited (p=0.045).

Conclusions: Successful health goals were more likely to be specific, measurable, and time-limited. Limitations of this study included difficulties in standard appraisal of attainability. Future studies could further establish a temporal link between SMART traits and goal completion.

Sponsor: Medicaid
IRB/IACUC#: 2014-125

1302 - Poster **Classification:** SPH Student

Presenter: James K. Akkidas **Department:** Health Management and Policy
Authors: James K Akkidas, UNT Health Science Center; Rajesh Mallampati, UNT Health Science Center; Thaddeus Miller Dr, UNT Health Science Center

Incarceration as a Predictor Of Latent TB Infection Among Homeless People in Tarrant County, Texas

Background: Latent tuberculosis infection (LTBI), which affects an estimated 13.2 million people in the U.S., is a major impediment to TB elimination in the U.S. Testing and treatment of high-risk groups is a key focus of TB prevention efforts. Residence in shelters and correctional facilities are risk factors for LTBI, and both are more common among homeless people. We examined incarceration as a predictor of LTBI among homeless people in Tarrant County, Texas.

Objective: To evaluate incarceration as a predictor of LTBI among homeless people in Tarrant County, Texas.

Methods: We analyzed local data collected for the Tuberculosis Epidemiologic Studies Consortium, a 10-site study funded by the Centers for Disease Control and Prevention to assess sensitivity and specificity of three commercially-available tests for LTBI: the tuberculin skin test and two interferon-gamma release blood assays: QuantiFERON®-TB Gold In-Tube, and T-SPOT®.TB test. Analysis was confined to homeless persons who used night shelters in Tarrant County, enrolled from July 2012 to December 2016. LTBI was defined as a positive result from any test. Multiple logistic regression evaluated the relationship between LTBI and history of incarceration while controlling for drug or alcohol abuse, tobacco smoking, and other demographic and risk factors.

Results: Among 1,030 shelter residents, history of incarceration was associated with increased likelihood of LTBI (adjusted odds ratio, 1.58; 95% confidence interval, 1.06 to 2.35).

Conclusions: Among homeless shelter users in Tarrant County, Texas, LTBI was more common among those with a history of incarceration. This may be a useful indicator to prioritize LTBI screening.

Sponsor: N/A
IRB/IACUC#: 2012-139

1303 - Poster **Classification:** SPH Student

Presenter: Shlesma Chhetri **Department:** Behavioral & Community Health

Authors: Shlesma Chhetri, UNT Health Science Center; Alita Andrews, UNT Health Science Center; Emily Spence-Almaguer, UNT Health Science Center; Jessica Grace, UNT Health Science Center; Erin Carlson, University of Texas at Arlington

Looking Beyond the Injuries: Identifying the Complex Healthcare Needs Among Survivors of Interpersonal Violence

Background: More than 1 in 3 women in America (35.6%) experience some form of interpersonal violence (IPV) during their lifetime (Black et al, 2011). The long-term negative impact on the physical and mental health of women experiencing violence has been well documented in the literature. There is evidence that IPV survivors have complex health needs and high health care utilization patterns (Rivara et al., 2007). However, a gap exists in the alignment of the nature of services provided versus the needs of IPV survivors. Services offered by IPV organizations are often geared towards meeting immediate needs for housing, financial assistance, and other forms of tangible support, particularly for individuals using emergency shelter services. Furthermore, these crisis periods are also aggravated by an increased risk for physical violence and stalking, and/or involvement in the criminal justice system. The purpose of this study was to understand the complex and holistic health needs of survivors who are utilizing IPV services.

Methods: This study utilized data collected during a needs assessment conducted among 99 women residing in Tarrant County. Participants were recruited from three service providers actively providing services to IPV survivors. The survey tool incorporated questions regarding victimization history, healthcare utilization, and Self-Regulation Questionnaires (SRQ-20) to capture the distress symptoms demonstrated by IPV survivors.

Results: The majority (80%) of participants reported at least one chronic health condition, yet 30% of the women mentioned not going to the doctor for routine healthcare. One-third of participants reported utilizing the ER for non-emergency reasons. While 70% of the sample reported having a place to go when sick and injured, 43% identified that place to be the ER. Among the participants, 53% reported experiencing 7 or more psychosomatic distress symptoms, meeting the WHO threshold for psychiatric distress.

Conclusions: This study illustrated that the needs of IPV survivors are complex and extend beyond physical injuries. It is imperative to look beyond the crisis indicators and address the stress and strains resulting from the violence that not only becomes burdensome for survivors but also results in greater health care utilization. Currently, the Technology Enhanced Screening and Supportive Assistance (TESSA) project is using this data to support the integration of IPV and healthcare services in the community.

Sponsor: USDHHS Office of Women's Health
IRB/IACUC#: 2016-080

1304 - Poster **Classification:** Pharmacy Student

Presenter: Jerome Uberu **Department:** Pharmacotherapy

Authors: Patrick Clay, UNT Health Science Center; Homero Silva, UNT Health Science Center; Jerome Uberu Jr, UNT Health Science Center

Health Literacy: Assessing the "Health Literacy Assessment Using Talking Touchscreen Technology" Survey in HIV Participants

Purpose: Health literacy is "the ability to obtain, process, and understand health information needed to make informed health decisions". Limited health literacy is related to poorer health and outcomes due to deficiencies in understanding basic health information. To address literacy needs, a baseline assessment is needed. The purpose of the survey is to assess the health literacy level of HIV patients in North Texas using a validated, online tool that can be used even in resource limited environments.

Methods: Participants at 4 distinct urban locations (an HIV specialty clinic, pharmacy, housing unit, and peer support group) gave verbal consent to complete the anonymous, online, audio-driven, validated "Health Literacy Assessment Using Talking Touchscreen Technology" (Health LiTT) survey. Questions assess ability to recall disease and medication understanding, read prescription labels and recall information after a simulated physician consultation.

Results: A total of 78 participants completed the survey (approx. 80% response rate). The average respondent was male (73%), non-White (28%), 43 years old (+/- 3.2 yr), completed high school (90%) and resided in an urban setting (93%). In interpretation of prescription labels, respondents performed better when figures were presented, with 94% (Take With Food) and 69% (Take With Water) correctly selected when prompted whereas questions on actions to take regarding label directions without images provided only 19% (Take on empty stomach) answered correctly. In disease state knowledge comprehension, 90% of respondents correctly understood both why medications were being used and consequences of incorrect administration. While 63% were able to correctly recall how the drug worked and less than half of respondents could recall the likelihood of side effects (44%) after a simulated physician counseling session.

Conclusions: Respondents performed better regarding general medication knowledge and following directions when images were provided, but performed worse when recalling specific drug information based on a pre-recorded simulation. HealthLiTT may improve patient education efforts by facilitating targeting of patient specific knowledge gaps in resource limited settings.

Sponsor: N/A
IRB/IACUC#: 2015-082

1305 - Poster **Classification:** SPH Student

Presenter: Leilani Dodgen **Department:** Behavioral & Community Health

Authors: Leilani Dodgen, UNT Health Science Center; Tanjila Taskin, UNT Health Science Center; Ahmed Iqbal, UNT Health Science Center; Heather Kitzman-Ulrich PhD, UNT Health Science Center, Baylor Scott and White Health

Characteristics of Physical Activity Among African American Women in the Better Me Within Program

Background: African American (AA) women experience the highest rates of obesity at 57.2% compared to other groups in the United States (38.2% white women, 46.9% Hispanic women); and have the lowest levels of physical activity with only 30% of adult AA women meeting national aerobic guidelines compared to 44% of white women. Physical fitness is an important driver of health and may be even more critical than weight loss for improving health and longevity. A recent study demonstrated that individuals with good cardiorespiratory fitness, even with a BMI in the overweight or obese category (BMI >25), had similar mortality rates to people whose BMI was in a healthy range (BMI < 25). The purpose of this study is to evaluate the effect of the Better Me Within (BMW) program on increasing physical activity among AA women in churches with a faith-enhanced diabetes prevention program (DPP) (intervention) compared to a standard DPP (control).

Methods: Data were collected from participants in the BMW program (2013-2016). Variables were explored from five domains at baseline and 16 weeks to assess the relationship with physical activity (total weekly minutes) including: 1) Demographic characteristics (age, education, number of children, marital status, income, insurance); 2) Existing medical conditions (weight and height to calculate body mass index (BMI), cholesterol levels, waist circumference, blood pressure, hemoglobin A1C, and fasting glucose); 3) Health behaviors (smoking, drinking, sedentary time); 4) Mental conditions (body appreciation, physical activity and nutrition self-efficacy, confidence for exercise, mood, stress, and motivation for eating and exercise); and 5) Diet (fruit intake, vegetable intake, total calories, total fat, total carbohydrates, and total protein).

Results: A total of 221 AA women were randomized to intervention or control (mean age=48.8+11.2; mean BMI=36.7+8.4; 52% technical or high school). There is a hypothesized positive effect expected between the intervention and physical activity between baseline and 16 week measures. Variables are being assessed through correlations and regressions to determine the effects on physical activity using SAS (version 9.4). The results will be expanded upon proper analysis.

Conclusions: Increasing physical activity among AA women is critical to improving long term health and risk for chronic disease. This study will provide information to improve evidence-based lifestyle programs for AA women.

Sponsor: National Institute of Minority Health and Health Disparities
IRB/IACUC#: 2011-164

1306 - Poster **Classification:** SPH Student

Presenter: Tonychris Nnaka **Department:** Epidemiology

Authors: Kayan Dunnigan, UNT Health Science Center; Alisa Rich, UNT Health Science Center; Tonychris Nnaka, UNT Health Science Center

Microcephaly and Zika Virus: Exploring Possible Factors for the Increase Prevalence in Brazil

Introduction: Recent studies have associated Zika virus with increased prevalence of microcephaly, abnormally small head circumference in newborns, among infants born in certain countries in South America. In the United States, data has shown that most states have maintained a high prevalence rate for microcephaly preceding the recent Zika outbreak. The question that has remained unanswered is whether the sudden increase in the prevalence of Zika virus in South American countries is truly attributed to bite of the female Aedes species of mosquito, or are other potential factors contributing to the increase. Several chemicals such as Pyrioxyfen, which was added to Brazilian drinking water for the first time in 2014 as a larvicide, is known to cause microcephaly. The use of such chemicals are controlled in the United States, but might not have similar regulations in other countries. Alcohol and drugs are teratogens that can cause microcephaly, the use of these substances are evident among certain ethnicities and countries (Mayo Clinic).

Methods: Utilizing data on the prevalence of microcephaly in the United States a two-way ANOVA of the prevalence of microcephaly in certain racial groups by state shows a significant difference in the prevalence of microcephaly by race in each state analyzed.

Results: The highest prevalence of microcephaly in the United States is in Alaska (19 per 10,000 live births), which does not have the Aedes species of mosquitos indicating that other factors are contributing to higher prevalence rates of microcephaly.

Conclusions: Given that there several causes of microcephaly and the prevalence of microcephaly in the United States more research should be done to determine if chemicals such as Pyrioxyfen are the cause of the recent rise in the prevalence of microcephaly in South America.

Sponsor: N/A
IRB/IACUC#: N/A

1307 - Poster **Classification:** SPH Student

Presenter: Ike R. Eke **Department:** Behavioral & Community Health

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Association Between Education Level and Spiritual Health Locus of Control

Objective: For observers to be able to understand the possible link between educational attainment and active versus passive spirituality.

Background: Spirituality is a core pillar within the African American (AA) community. It has permeated many facets of black culture over time, and has shaped the black experience. Previous studies have found that individuals with more spirituality were more likely to pursue higher education. However, little is known on how education attainment influences spiritual health locus of control (e.g., how God plays a role in your health).

Methods: Cross-sectional data was collected from a baseline survey administered to participants in Cohort 1 and 2 of the Better Me Within Program. Participants were stratified as high education (college degree or above) or low education (high school degree or below) based on self-report. Spiritual health locus of control was evaluated with the spiritual health locus of control survey, and responses were calculated to create an active (God empowers individuals to be proactive about their health) and passive (God has control over an individuals health) spiritual health locus of control and active or passive spirituality based on survey responses. Analysis method used was the non-parametric Wilcoxin test.

Results: 145 AA women with a BMI > 25 participated (mean age=49.6, SD=11.65). The Wilcoxin test demonstrated a higher mean passive spirituality score higher in the lower education group as compared to the higher education group (u=3.05 low education, u=1.27 high education; p<.00002). Data shows that there were no significant differences between the mean scores for active spirituality between those in the high and low education group (u=26.42 low education, 26.41 high education; p=.8).

Conclusions: Passive health locus of control has been associated with poorer health behaviors. Individuals with lower educational attainment are at a higher risk for health issues and may lack access to healthcare. The additional belief that God control's ones health, e.g., a passive spiritual health locus of control, may contribute to these health disparities.

Sponsor: N/A
IRB/IACUC#: 2011-164

1308 - Poster **Classification:** SPH Student

Presenter: Esther Galadima **Department:** College of Pharmacy
Authors: Esther Galadima MBBS, UNT Health Science Center; Wei Yuet MBBS, UNT Health Science Center; Jenny Lee PhD, MPH, CHES, UNT Health Science Center

Health Practices and Perceptions on Lifestyle Counseling Among Student Pharmacists

Background: Pharmacists are positioned to promote and facilitate health behavior change given their accessibility within the community. To ensure that student pharmacists are adequately trained to fulfill these roles, public health topics are integrated throughout the Center for the Advancement of Pharmaceutical Education (CAPE) Educational Outcomes 2013 which guide the curricular decisions within the academy. There is a paucity of data regarding student pharmacists' perceptions on lifestyle counseling. The health status and health practices of student pharmacists in the United States are not well described.

Objective: To determine health status, health practices, and perceptions on lifestyle counseling among student pharmacists.

Methods: A survey was administered to all students in a PharmD program at a public university in September 2016-October 2016. The survey has three areas: 1) personal characteristics, 2) health behaviors, and 3) opinions on lifestyle counseling. Descriptive statistics were performed to characterize health status and health practices. Logistic regression was performed to identify relationships between variables and student-specific factors including demographics and current standing in the curriculum. A priori level of significance was set at 0.05.

Results: The 93 students who participated were predominantly female (57%) and non- Hispanic white (41.9%) with mean age of 27.7 years. 41.3% had BMI classified as overweight or obese. 45.3% of females and 43% of males considered themselves in very good health ($p = 0.72$). 66% of females and 43% of males had a personal physician ($p = 0.02$) with > 50% of these students stating that the physician emphasized disease prevention ($p = 0.17$). More than 90% of student pharmacists want to engage in health-promoting lifestyles such as eating more fruit and vegetables ($p = 0.002$). More female students than male students perceive patient counseling on nutrition as highly relevant to their practice (OR 2.13, CI 0.84-5.36).

Conclusions: Student pharmacists reported good health practices in comparison to other adults in the United States. Student pharmacists are interested in personal health-promoting practices including increased consumption of fruits and vegetables. There are several areas of lifestyle counseling that student pharmacists deem irrelevant to their intended practice with differences in opinion based on gender.

Sponsor: N/A
IRB/IACUC#: 2016-109

1309 - Poster **Classification:** School of Health Professions Student
Presenter: Haley Hammond **Department:** Physician Assistant Studies
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Does Smoking Status Differ by Veteran Status in Young Adult Males?

Introduction: Cigarette smoking is widespread among veterans, but few studies have assessed smoking behavior in younger veterans or between young veterans and non-veterans. Thus, the purpose of this study was to investigate whether veteran status is related to smoking status in young adult males.

Methods: This cross-sectional analysis used 2014 BRFSS data for males ages 18-40 from Alabama, Arkansas, South Carolina, Tennessee, and Virginia. Multiple logistic regression analysis was used to assess the relationship between veteran status and smoking status, while controlling for age, ethnicity/race, education level, employment status, income level, mental health, and depression.

Results: In all five states, the majority of young adult males reported current smoking (59-64%) and few were veterans (10-17%). After controlling for demographic and psychosocial factors, smoking status was not significantly related to veteran status but was significantly related to age and education level (moderate effect sizes) in three of the five states.

Conclusions: Overall, smoking status is not significantly related to veteran status in general population samples of young adult males. Smoking remains prevalent in this age group but probably at a lower percentage than reported in this study. Limitations of the study include dichotomous variables and cross-sectional study design. Practitioners should screen young adult males for smoking status, educate patients on the relationship of tobacco use and health, and provide guidance and referrals for smoking cessation.

Sponsor: N/A
IRB/IACUC#: 2016-074

1310 - Poster **Classification:** SPH Student

Presenter: Hadis Hosseinzadehnaseri **Department:** Environmental & Occupational Health
Authors: Hadis Hosseinzadehnaseri, UNT Health Science Center; Ebony Calderon, UNT Health Science Center; Alisa Rich, UNT Health Science Center

Increasing Atmospheric Levels of 1,2,4-TMB in the DFW Metroplex from Natural Gas (Extraction) Processing from 2005 – 2015 and Asthma Rate

Introduction: 1,2,4-Trimethylbenzene (1,2,4-TMB) is an industrial solvent used in 21 different hydraulic fracturing fluids. 1,2,4-TMB is found to contribute to the formation of photochemical smog in the presence of other VOCs, which is known to exacerbate respiratory conditions. 1,2,4-TMB contributes to formation of Peroxyacetyl nitrate (PAN), a component of photochemical smog reactive to sunlight and a factor in ozone production. The purpose of the study was to examine the overall trend in atmospheric 1,2,4-TMB, and the rate of Asthma over the same time period.

Methods: Ambient concentrations of 1,2,4-TMB were collected from the Texas Commission on Environmental Quality (TCEQ) database, and the U. S. Environmental Protection Agency's Urban Air Toxics Monitoring Programs (UATMP) report from 2005-2013. Asthma data was collected on children and adults from the 2015 United Way Tarrant County Community Assessment (UWTCCA).

Results: Based on TCEQ data, the average amount of 1,2,4-TMB has increased during the past decade. The maximum observed level of 1,2,4-TMB increased by 437.5% from 2008 to 2010, and concentrations were 790% higher from 2008-2009, 2,119% higher in 2010, and 10,747% higher in 2011 (Rich & Orimoloye, 2015) when compared to UATMP. The 2015 UWTCCA indicates a higher asthma prevalence in North Texas. In 2010, lower respiratory disease was ranked as the 4th leading cause of death in Tarrant County. Asthma among Tarrant County adults is 9.6% higher and 17.6% higher for children compared to Texas. 1,2,4-TMB is capable of producing PAN, a powerful respiratory irritant present in photochemical smog. Increasing levels of 1,2,4-TMB in the DFW area due to natural gas extraction may be a contributing factor to the increasing rates of asthma. 1,2,4-TMB is also a factor in smog production, a respiratory irritant and exacerbator of asthma.

Conclusions: Increased atmospheric levels of 1,2,4-TMB was found in areas of natural gas extraction and processing in the DFW area. 124-TMB is a factor in PAN production and ozone, which are respiratory irritants. Fort Worth has a high rate of asthma, which may be associated with increased levels in 1,2,4-TMB, PAN, photochemical smog, and ozone.

Sponsor: N/A
IRB/IACUC#: 2013-222

1311 - Poster **Classification:** SPH Student
Presenter: Emanehi Iyioriobhe **Department:** Environmental & Occupational Health
Authors: Emanehi Iyioriobhe, UNT Health Science Center; Marcy Paul, UNT Health Science Center

Public Health of Birth and Loss: Rituals from Around the World

Background: Across the world, cultures differ in their approach to childbirth or loss after pregnancy. This review examines possible connections between the socio-ecologic model (SEM) and rituals surrounding childbirth or child loss.

Methods: A literature review addressed birth and loss practices around the world. Databases searched included PubMed, Scopus, Academic Search Complete, and Global Health from 2006 to 2016. Inclusion criteria were birth rituals, birth practices, infant death, and post-partum practices. Exclusion criteria were practices after miscarriages and childbirth or death after three years. Forty articles were selected and reviewed as full texts. The identified rituals were further grouped together into rituals based on modern medical practices, rituals based on culture and societal traditions, postpartum rituals, and religious rituals. Connections between the SEM behind the rituals were examined.

Results: North America, Western, and Eastern Europe had macro-level factors such as national, state, and local laws that contributed to activities practiced during childbirth or loss after pregnancy. Organizational factors and community relationships played a role in the birth activities practiced in parts of Asia and South America. Religious factors, interpersonal and individual factors were identified in Africa.

Conclusions: Birth rituals connected with influences such as societal factors and policies were seen in westernized countries, as compared to influences such as community norms, interpersonal relationships, and individual attitudes and beliefs which are seen in other parts of the world.

Sponsor: National Heart, Lung, and Blood Institute of the National Institutes of Health.
IRB/IACUC#: N/A

1312 - Poster **Classification:** GSBS Student

Presenter: Tommy Li **Department:** Graduate School of Biomedical Sciences

Authors: Tommy Li, UNT Health Science Center; Scott Walters, UNT Health Science Center; Rajesh Nandy, UNT Health Science Center

Factors Predicting Completion of Daily Phone Assessments

Objective: Participants in long-term studies often have varying rates of compliance with study activities, especially when those activities are required daily for extended periods of time. This study examined predictors of daily survey completion among a group of permanent supportive housing residents enrolled in m.Chat, a health coaching program.

Methods: A subset of participants in the program received a prepaid cellphone with unlimited voice and text minutes, with the requirement that they complete a short automated assessment each morning. The phone recorded the number of days the participant was prompted to complete the assessment, the number of completed assessments, and the percentage completed each month. We examined age, sex, race, mental illnesses, reading ability, and alcohol use as predictors of percent completion.

Results: Of the 109 participants who carried the phone for at least one month, three predictors impacted daily completion rate: a history of hallucinations, binge drinking, and baseline reading level. Of the three, having experienced hallucinations was the only statistically significant predictor. Subjects who had not experienced hallucinations in the past year had a completion rate approximately 10% higher than those who had experienced hallucinations.

Conclusions: While some characteristics of a participant, namely their age, sex, race, and substance use, do not accurate predict the likelihood of completion rate of a daily assessment, other characteristics such as hallucinations may play a role. Additional research could help identify reliable predictors of compliance that would allow investigators to maximize response rates to long term assessment protocols. This may allow investigators to predict how reliable a participant will be when daily completion of an assessment is required on the phone.

Sponsor: N/A
IRB/IACUC#: 2014-125

1313 - Poster **Classification:** SPH Student

Presenter: Rajesh Mallampati **Department:** Biostatistics

Authors: Rajesh Mallampati, UNT Health Science Center; Alexis Rendon, UNT Health Science Center; Devang Agravat, UNT Health Science Center; Gabriela Gaona Villarreal, UNT Health Science Center; Iram Qureshi, UNT Health Science Center; Subhash Aryal, UNT Health Science Center

Cooking Dinner at Home: Analysis of the National Health and Nutrition Examination Survey (NHANES) 2009-2010

Purpose: The frequency of cooking dinner at home in American households has declined in recent decades. We determined the prevalence of cooking dinner at home among 2009-2010 NHANES respondents.

Methods: Multinomial regression, poisson regression, and negative binomial regression models were used to predict increased odds of cooking dinner at home. Federal Poverty Level (FPL), level of education, age, gender, country of origin, and family structure were significant predictors.

Results: Survey respondents who were below 350% FPL, had lower educational attainment, older age, foreign-born, and living with a partner or dependents were more likely to have increased rates of cooking dinner at home. In contrast, respondents who were younger, Black, and male were more likely to have decreased rates of cooking dinner at home.

Conclusions: Further study is warranted to determine how healthier food preparation habits can be disseminated across diverse groups.

Sponsor: N/A
IRB/IACUC#: 2016-039

1314 - Poster **Classification:** SPH Student

Presenter: Abdullah Mamun **Department:** Biostatistics

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Association of Sedentary Behavior with Salivary Estradiol Level Among African-American Women Who Are Overweight

Purpose: Recent studies have reported that sedentary behavior may have multiple adverse health outcomes in adults, and is related to elevated levels of estradiol that are associated with breast cancer, ovarian cancer, and endometrial cancer. A growing body of research has assessed the association of sedentary behavior with estradiol levels, however, few studies have been in African-American (AA) overweight women who are disproportionally diagnosed with cancer. The objective of this study was to assess the association of self-reported sedentary behavior of AA overweight women with salivary estradiol level.

Methods: We recruited 263 AA overweight (BMI>25, mean BMI 36.8 (SD 8.5), mean age 49.4 (SD 11.6) years) women from a faith-based weight reduction program from 2014-2016 in Dallas, Texas. Approximately 4mL of saliva was collected over four consecutive weeks. Saliva was stored in a sub 80^0C freezer and sent to a lab to assay. Weekly sedentary behavior was collected with a valid and reliable survey for weekdays and weekends that included hours of sitting to watch television, working on the computer, riding in a car, bus, or train, and other sitting practices. We used Pearson's-correlation and linear models to estimate the unadjusted and adjusted association of sedentary behavior with estradiol level.

Results: Average weekly sedentary time was 40.6 hours (SD = 17.5). The range of estradiol level was 0.50 pg/mL to 3.50 pg/mL with mean 1.13 pg/mL (SD = 0.55). Sedentary time was positively associated with estradiol level (correlation coefficient = 0.18, p2= 8.4%, $p<0.01$).

Conclusions: Self-reported sedentary hours for AA overweight women were less than the national average (5.8 hours in this study vs. 7.7 hours nationally, per day). We found that sedentary time was a predictive factor for estradiol level, and higher sedentary time was associated with elevated estradiol levels. Future research should further explore how sedentary behavior and elevated estradiol levels influence cancer risk in AA women.

Sponsor: NIH
IRB/IACUC#: 2011-164

1315 - Poster **Classification:** SPH Student
Presenter: Ndolembai S. Njesada **Department:** Environmental & Occupational Health
Authors: Ndolembai Njesada, UNT Health Science Center; Alisa Rcih, UNT Health Science Center

Environmental Factors of Climate, Air Quality and Altitude in Sickle Cell Pain Events: Defining the Paradigm

Objective: The purpose of this present review is to give a general overview of research concerning the role of environmental factors on sickle cell disease and determine whether these factors are consistently associated with Sickle Cell Disease (SCD).

Materials and Methods: Evidence suggests that the recurrent pain episodes experienced by SCD patients are associated with the polymerization of the deoxygenated hemoglobin (HbS), and this process is dependent on hypoxia, PH, temperature and the hydration of red blood cells which could be influenced by environmental factors.

Sickle cell disease (SCD), a hereditary red blood disorder, is a global health problem, and more than 100,000 babies are born with it annually. There are more than 300 million carriers of the sickle cell trait worldwide. In the USA, the average lifetime cost of sickle cell disease per patient is $460,151with higher mortality rates among adults.

There were 96 articles identified from the online databases (PubMed, Google Scholar, Medline (National Library of Science), Web of Science, Scopus and Science Direct) based on the following words: “Environment”, “sickle cell disease”, “environmental factors”, “environmental determinants”, “risk factors”, “sickle cell anemia”, “air quality”, “climate”, “altitude”, “infection”, “housing”, and “socioeconomic status”. 38 studies met the inclusion criteria of peer reviewed, conducted among human subjects and written in English. Most of the studies were associated with the impact of environmental factors on SCD crises.

Results: Climate has been strongly implicated as a trigger for pain crises in sickle cell. 3 studies linked wind speed to pain crises. 2 Studies associated low temperature with SCD crises while 12 other studies linked high temperature to the same crises. Additionally, 3 studies found no relationship between pain and high temperature. 5 studies associated pressures to pain (4 at high pressure and 1 at low pressure). 3 studies associated humidity to pain (1 high, 1 low humidity) and 3 others found no association. For rain, 3 found associations while 3 others found no association.

Conclusions: The following conclusion can be drawn: although some results are contradictory, climate determines the complication rates among SCD patients, and there is need for further research to establish a causal relationship.

Sponsor: N/A
IRB/IACUC#: N/A

1316 - Poster **Classification:** School of Health Professions Student
Presenter: Jenna Oropeza **Department:** Physician Assistant Studies
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For General Health, Does Alcohol Affect Sleep Patterns In Males Ages 45-80?

Introduction: More than 60 million Americans experience long-term sleep problems. Although alcohol use is related to sleep issues, little is known about the relationship between alcohol and sleep in middle aged to elderly males. The purpose of this study was to evaluate the relationship between adequate sleep and alcohol use in males ages 45-80 years old.

Methods: This cross sectional analysis used 2014 BRFSS data for males ages 45-80 from Ohio, Montana, Wisconsin, and Wyoming. Multiple logistic regression analysis was used to assess the relationship between alcohol use and adequate sleep, which controlled for age, ethnicity, children at home, employment status, exercise, marital status, and tobacco use (chew and smoke).

Results: The majority of males ages 45-50 years old reported that they averaged at least 7 hours of sleep in the past 30 days (64-72%), and few reported that they binge drink (14-23%). After controlling for various factors, sleep was not related to binge drinking in any of the four states but was related to exercise habits (moderate effect sizes) in all four states.

Conclusions: Overall, alcohol use was not related to sleep in males ages 45-80 years old in any states, but exercise was related (moderate effect sizes) in all states. The results of this study may generalize to primary care practice patients, but not to other clinical populations. This cross-sectional study did not assess sleep “patterns” or quality of sleep. Although alcohol was not found to be related to sleep, it is standard practice to screen all patients for alcohol use and adequate sleep. It’s indicated to screen for exercise habits in those who have inadequate sleep.

Sponsor: N/A
IRB/IACUC#: 2016-074

1317 - Poster **Classification:** SPH Student

Presenter: Catherine Otakore **Department:** Environmental & Occupational Health

Authors: Catherine Otakore, UNT Health Science Center; Adebola Adeyemi, UNT Health Science Center; Rasheedat Sadiq-Onilenla, UNT Health Science Center; Matthew Moncus, UNT Health Science Center; Maya Nair, UNT Health Science Center

Process Improvement Based on the Outcome of an Audit In the Higher Education Safety Program

Purpose: The process put in place by the National Institute of Health (NIH), and the Environmental Health and Safety Department of the University of North Texas Health Science Center (UNTHSC) is designed to encourage safe practices in higher educational institutions with emphasis on their laboratories. Process improvement is an opportunity to increase efficient laboratory audits which positively influences safety practices in the laboratories. The aim of this study is to examine the current laboratory auditing by assessing the ability of the department to conduct audits through looking at staffing levels and, resources available, with the greatest emphasis on tools currently used. The outcome will help us upgrade the process and tools used for an effective audit.

Methods: We used a regular lab inspection method for collecting the data. My team modified pre-existing checklist from NIH and a list developed by the University's Environmental Health and Safety Department, to carry out unscheduled laboratory inspections for the main research buildings at UNTHSC. We tried to determine the deficiencies that occurred during a regular work day at the lab that could put the workers at risk. Excel software was used to analyze the data collected which included, shortcomings in the lab and what percentage affected either, policy, good training programs or an efficient auditing program.

Results: We inspected 106 laboratories and found minor deficiencies in all. An error in the checklist and miscommunication between the auditors and lab workers resulted in the finding of a deficiency in 100% of the laboratories on one item. Duplicated results, was seen from similar questions (less than 1%), and some results had conflicting answers to the same issues.

Conclusions: Based on the results of this study the checklist needs to be modified annually in keeping with the changes in the laboratories. The questions on the lists should be amended; there should be no repetitions, no similar meanings and no redundant questions which have no impact on the safety practices in the lab. Ultimately, the lists should be merged to form one useful list. The laboratory staff should be trained annually or instructed on how to meet compliance with the laboratory inspections. The increase in resources, team members, and biannual training of the auditors will all work towards an efficient auditing program. Changing the entire verification process into an online electronic version will be more time effective with efficient data storage and accessibility.

Sponsor: N/A
IRB/IACUC#: N/A

1318 - Poster **Classification:** SPH Student
Presenter: Saehwan Park **Department:** Health Management and Policy
Authors: Saehwan Park, UNT Health Science Center; Liam O'Neill, UNT Health Science Center

Impacts of Methicillin-Resistant Staphylococcus Aureus on Length-of-Stay Among Texas Hospital Inpatients Using ICD10CM Codes

Objective: Patients who contract Methicillin-resistant Staphylococcus aureus (MRSA) during their hospital stay will have a significantly longer length of stay, resulting in increased costs and worse outcomes. In practice, however, it may be difficult to estimate the additional health care costs that can be attributed to a MRSA infection. Moreover, it is ethically impossible to conduct a randomized controlled trials (RCT) with a sufficiently large sample. The endogenous nature of hospital acquired infections (HAI) and limitations of ICD-9-CM administrative data have also posed challenges to researchers. The purpose of this study is to examine the effects of different categories of MRSA infections on length of stay among hospitalized patients in Texas, using ICD10CM data which have recently become available.

Design: We used Texas Health Care Information Collection (THCIC) inpatient database for the fourth quarter in 2015. We only included hospitalized patients whose length of stay exceeded one day. The final sample included 654,074 discharges. The dependent variable was each patient's length of stay (LOS). Explanatory variables included five different MRSA types (MRSA sepsis, MRSA pneumonia, MRSA unspecified sites, other MRSA infections, and MRSA colonization), recommended by ICD-10-CM guidelines. In order to properly assess MRSA effects, we controlled patients' medical status using major diagnosis categories and Charlson comorbidity index. Other patient-level confounders were adjusted as well, including age, gender, race and ethnicity, admission sources, and admission types. Negative binomial models were used for our analysis. In additions, we used propensity-score matching (PSM) to reduce the bias due to confounders and to reasonably infer causality.

Findings: The mean LOS among MRSA patients varied across different types of MRSA, ranging from 8.9 days (MRSA colonization) to 20.6 days (MRSA pneumonia), while average LOS among non-MRSA patients was 6.0 days. Our multivariate model indicated that MRSA infections significantly increased the length of stay and the effects by 52% up to 131% depending on MRSA types. Matched comparison revealed endogeneity, showing that the effect of MRSA infections reduced to 28%-77%, but were still significant, except MRSA colonization (p=0.119). The differences in days of LOS were 8.6 days for MRSA pneumonia (IRR=1.768; p

Conclusions: While most types of MRSA increased LOS significantly, our study also confirmed endogenous relationship between length of stay and MRSA infection, potentially because developed MRSA may prolong hospitalization, which may itself increase the risk of exposure to other pathogens. This bi-directional relationship is likely to result in over-estimations, causing exaggerated benefit predictions. Nevertheless, our results verified that MRSA accounted for 4-8 days (32-77%) of unnecessary hospitalization. The use of ICD10CM data overcomes some of the limitations of previous studies, i.e., those based on ICD9CM, as it includes five sub-categories of MRSA infections.

Implications: Economic analyses for interventions, programs, and structural investments which consider prevention of HAIs can use our results to estimate expected benefits of reduced MRSAs. Hospital managers and health care professionals can better manage various MRSAs by understanding different

risks and impacts. A perennial difficulty in studying MRSA infections is the lack of accurate and reliable data. The use of ICD10CM combined with public-reporting of MRSA infections shows great promise toward improving patient safety.

Sponsor: National Science Foundation (NSF) **IRB/IACUC#:** 2017-029

1319 - Poster **Classification:** SPH Student

Presenter: Aliya Qureshi **Department:** Family Medicine
Authors: Aliya Qureshi, UNT Health Science Center; Jessica De Hoyos, UNT Health Science Center; Kimberly Fulda, Family Medicine, NorTex

Bullying and Sexual Victimization as Predictors for Substance Abuse and Physical Fighting Among High School Students

Purpose: Bullying and sexual violence have both been associated with negative health behavior outcomes in adolescent and youth populations. Traditionally, these topics have been researched separately, however, studies suggest that polyvictimization may increase the risk of experiencing negative health outcomes and behaviors. The objective of this study is to explore the association between having experienced both bullying and sexual victimization with substance abuse and physical fighting among American high school students.

Materials and Methods: The data from the 2015 Youth Risk Behavior Surveillance System (YRBSS) for high school students will be used. Explanatory variables will be chosen based on indication of bullying and sexual victimization. Bullying will include either experiencing electronic bullying or traditional bullying, and sexual victimization will include ever being physically forced to do sexual acts, physically forced to do sexual acts by someone you are dating or going out with, or physically hurt by someone you are dating or going out with. Dependent variables will include substance abuse and physical fighting. Logistic regression will be used to examine the association of experiencing both bullying and sexual victimization with substance abuse and physical fighting.

Results: 15,624 students' questionnaires were obtained. Weighted percentages show that 48.7% were females and 51.3% were males. In addition, 27.2% students were in 9th grade, 25.7% in 10th grade, 23.9% in 11th grade, and 23.1% in 12th grade. 15.5% of students reported being electronically bullied and 20.2% reported being bullied at school. 6.7% of students reported ever being physically forced to have sexual intercourse. Results from logistic regression are pending. The study predicts to find association between polyvictimization of experiencing both bullying and sexual victimization with substance abuse and physical fighting.

Conclusions: Studies suggest that polyvictimization resulting from experiencing both bullying and sexual victimization may be associated with negative and violence-related behaviors in high school populations. When investigating the association between victimization and these behaviors, overestimation of a single form of victimization may occur if multiple forms of victimization are not accounted for since the behavior may be explained by other or multiple forms of victimization.

Sponsor: N/A **IRB/IACUC#:** 2017-038

1320 - Poster **Classification:** SPH Student
Presenter: Alexis Rendon **Department:** School of Public Health
Authors: Alexis Rendon, UNT Health Science Center; Scott Walters, UNT Health Science Center

How are Incentives Spent? A Look at Gift Card Purchases Among Low-Income Research Participants

Objective: Incentives are frequently used to motivate volunteers to participate in research studies. This study examined the kinds of things that low-income study participants purchased with their incentive gift cards.

Methods: For participating in a health coaching program, study participants received a $25 or $35 Walmart gift card every 6 months. During follow-up phone assessments, we asked participants what kinds of items they purchased with their most recent gift card.

Results: Among 259 respondents, the most commonly reported purchased items were food (30.5%), household items (14.2%), clothing (12.6%), and personal hygiene items (11.9%). Less common items included cigarettes (1.6%), gifts for others (2.6%), pet food (2.6%), and reporting the gift card as unspent (2.6%). Additionally, we found that 73.4% of reported purchased items would have qualified as wellness items that could have been purchased using the study participant's monthly $60 allowance.

Conclusions: Most study participants reported spending their incentive gift cards on items that were congruent with health improvement goals of the health coaching program. This information may be useful in tailoring incentives in a way that helps participants reach their health and wellness goals.

Sponsor: N/A
IRB/IACUC#: 2014-125

1321 - Poster **Classification:** SPH Student

Presenter: Rasheedat A. Sadiq-Onilenla **Department:** Environmental & Occupational Health
Authors: Rasheedat Sadiq-Onilenla, UNT Health Science Center; Adebola Adeyemi, UNT Health Science Center; Catherine Otakore, UNT Health Science Center; Matthew Moncus, UNT Health Science Center; Maya Nair, UNT Health Science Center

The Need for Review and Improvement of Laboratory Training Program in UNTHSC

Introduction: The three main components of an efficient safety program are policies that outline the regulatory requirements, training programs that educate the research community about the risk involved and the audit program that ensure the effective safety practice implementation.

The importance of an excellent safety program cannot be undermined in an academic setting because it is an essential tool for smooth running of daily activities on the campus. An efficient safety program ensures that the research activities are in compliance with the federal, state and institutional level regulations. Thus the safety program protects the employees and environment from exposure to hazardous materials The objective of this study is to improve the training aspect of the UNTHSC Environmental Health and Safety Laboratory Inspection Program.

Methods: Unscheduled inspections were carried out to examine safety practices in laboratories across campus. A total of 92 laboratories were inspected in which some of the laboratories use strong chemicals, some work with cell lines, biohazard pathogens and some work with laser materials. Minor deficiencies identified during the inspection were analyzed and a program improvement plan was created.

Results: Data analysis revealed minor deficiencies in the safety practices in the laboratories inspected.

Defaults in the use of Personal Protective Equipment (PPE), laboratory manuals, chemical inventory keeping, and other safety procedures were discovered.

Recommendations: Training and retraining of laboratory personnel; quarterly lab inspections.

Sponsor: N/A
IRB/IACUC#: N/A

1322 - Poster **Classification:** SPH Student

Presenter: Jacquelyn Sanchez **Department:** Behavioral & Community Health
Authors: Jacquelyn Sanchez, UNT Health Science Center; Shlesma Chhetri, UNT Health Science Center; Emily Spence-Almaguer, UNT Health Science Center; Yara William, UNT Health Science Center; Jennifer Miller, UNT Health Science Center

Navigating Reentry: "Am I Gonna be Able to Get Back to Who I Was?"

Background: During the past several decades, incarceration rates among men and women have increased in the United States (Belknap, 2015). Thus, community reentry and diversion programs have been established and expanded to prevent recidivism post-incarceration. In a study that examined the risk factors associated with recidivism upon release, authors reported that the likelihood of recidivism was 33% for women and 47% for men during an average follow-up length of 3.5 years (Olson, Stalans, & Escobar, 2016). With limited research on reentry and diversion programs, there is a gap in the literature in understanding the needs and challenges faced by people transitioning into the community. This study addressed the gap by examining these individual's perceptions of factors that hinder or facilitate successful reentry.

Methods: Participants for this study were recruited through a diversion and reentry program located in Fort Worth, Texas. A total of 6 focus groups were conducted with 26 participants. The attendance in each group ranged from 2 to 9 participants. All participants had a prior history of being convicted of a drug/alcohol related crime. Time since release from incarceration ranged from years to weeks. Qualitative data were analyzed using open, axial and selective coding procedures associated with grounded theory. Multiple coders were utilized to promote inter-coder reliability.

Results: An emerging theme highlighted in the study was the multi-faceted and complex barriers faced by the participants during reentry. The three major categories of challenges and needs identified pertained to structural, personal and environmental/supportive systems. Participants indicated that comprehensive services such as transportation, job training, family reunification and help with living situations provided by community programs were key to their successful reentry. At the individual level, participants echoed a sense of shame and guilt that hindered their recovery process. Additionally, family support, self-acceptance and intrinsic motivation were recognized as being enabling factors towards successful reentry.

Conclusions: Individuals reentering the community face significant challenges in the process. To best support the reentry population, programs must focus on providing tangible support and personalized assistance. The qualitative information can help guide future interventions in reaching the needs of the target population.

Sponsor: United States Department of Justice -- Office of Justice Programs -- Bureau of Justice Assistance
IRB/IACUC#: 2015-045

1323 - Poster **Classification:** School of Health Professions Student

Presenter: Brock Sterry **Department:** Physician Assistant Studies

Authors: Brock Sterry PA-S, UNT Health Science Center; Giftson Joseph PA-S, UNT Health Science Center; Grant Morgan PA-S, UNT Health Science Center; Kevin D. Schmitz PA-S, UNT Health Science Center; Jessica Hartos PhD, UNT Health Science Center

Does Obesity Differ by Socioeconomic Status in Middle Aged Men?

Purpose: Obesity is a devastating health issue that is increasing in prevalence in the United States, but little is known regarding the relationship between obesity and income level amongst middle aged men. Thus, the purpose of this study was to assess whether there is a relationship between obesity and socioeconomic status in 35-44 year old males.

Methods: This cross sectional analysis used 2014 BRFSS data for males ages 35 to 44 from Missouri, Tennessee, Michigan, and Indiana. Multiple logistic regression analysis was used to assess the relationship between obesity and socioeconomic level which included income level, education level, and employment, while controlling for children at home, exercise, ethnicity, sleep, and metropolitan status.

Results: A low proportion of the target population reported being obese (34-37%), and socioeconomic status categories range from low to high across states. After controlling for demographic and social factors, obesity was significantly related to education level (moderate to large effect sizes) in Michigan and Indiana.

Conclusions: Overall, obesity was not shown to be related to socioeconomic status in general population samples of middle aged males. In primary care settings, it can be assumed that 34% of people will be obese. Due to a cross sectional design, this study could not assess the relationship between obesity and socioeconomic status over time. Although this study could not determine a relationship between obesity and income level, it is recommended that primary care practitioners know about, assess, and educate their middle aged male patients about the health risks of obesity.

Sponsor: N/A
IRB/IACUC#: 2016-074

1324 - Poster **Classification:** SPH Student

Presenter: Erica L. Stockbridge **Department:** Health Management and Policy
Authors: Erica Stockbridge MA, UNT Health Science Center; Leah Polcar MA, Magellan Health, Inc.; Thaddeus Miller DrPH, UNT Health Science Center

Using Big Data to Examine Healthcare Quality and Outcomes: Claims Data Illuminate Association Between Behavioral Health and Preventable Hospitalization in Diabetic Patients

Objective: High quality outpatient care for individuals with diabetes reduces the likelihood of acute diabetes-related complications and associated potentially preventable hospitalization (PPH). Comorbid behavioral health (BH) conditions can be a barrier to high quality outpatient diabetes care and may contribute to PPHs, but the association between BH comorbidities and PPHs has not been well-studied. We sought to determine if comorbid BH conditions are associated with an increased likelihood of diabetes-related PPHs.

Study Design: We used a multivariable negative binomial-logit hurdle regression model to determine whether BH conditions were associated with diabetes-related PPHs as defined by the Agency for Healthcare Research and Quality. Covariates included sociodemographic and other comorbid medical condition variables.

Materials: A national sample of medical and pharmacy claims data from the Optum Impact Research Database representing commercial insurer-covered healthcare received between 2011 and 2013 for 4,000,000 people. A total of 229,039 individuals met inclusion criteria (diagnosed/treated diabetes, aged 20-64, and complete data) and were included in analysis.

Results: Claims effectively identified increased risk for PPH among diabetic patients with BH comorbidities. 20.7% had ≥1 BH condition and the risk for multiple PPHs increased as individuals' counts of BH conditions increased. Schizophrenia, mood disorders, alcohol use disorders, and substance use disorders were each independently associated with increased risk of ≥1 PPH and an increasing number of PPHs.

Conclusions: People with diabetes and comorbid BH conditions have a higher likelihood of and volume of PPHs. The results suggest that enhanced treatment approaches or improved care quality may be useful to improve health and other outcomes for this population. Claims data provide an accessible and effective approach to evaluation.

Implications: Targeted interventions including case management, home health services, pharmacy management, or other structural enhancements may reduce hospitalizations in persons with comorbid diabetes and BH conditions. Given the significant proportion of diabetic patients with ≥1 diagnosed BH comorbidity, integrating diabetes care into BH treatment may drive improved health outcomes and cost savings. Evaluations of quality improvement activities focused on this population should consider using PPHs as outcome measures and claims as a data source.

Sponsor: N/A
IRB/IACUC#: 2017-018

1325 - Poster **Classification:** SPH Student

Presenter: Tanjila Taskin **Department:** Environmental & Occupational Health

Authors: Tanjila Taskin, UNT Health Science Center; Rajesh Mallampati, UNT Health Science Center; Amy Board, UNT Health Science Center; Thaddeus L. Miller, UNT Health Science Center

Association Between Self-Reported Diabetes Mellitus and Latent Tuberculosis Infection in a U.S.-Born Homeless Population

Background: Latent TB infection (LTBI) is disproportionately prevalent among certain US populations, including homeless persons.Diabetes mellitus (DM) is also more common among those with LTBI and suggests higher risk for development of TB disease.A significant association between LTBI and self-reported DM in homeless populations would support self-report as potentially useful to ascertain this important risk.

Objectives: To evaluate associations between self-reported DM and LTBI among persons using night shelters in an urban Texas county.

Methods: We analyzed data from U.S.-born persons using night shelters in Tarrant County, Texas during January 2013 to December 2016. Study data are a local subset of data collected by the Tuberculosis Epidemiologic Studies Consortium, a 10-site study funded by the Centers for Disease Control and Prevention to assess sensitivity and specificity of three commercially-available tests for LTBI: the tuberculin skin test and two interferon-gamma release blood assays: QuantiFERON®-TB Gold In-Tube, and T-SPOT®.TB test. We defined LTBI as a positive result on any test. Multiple logistic regression was used to evaluate relationships between LTBI and self-reported DM while controlling demographic and other factors.

Results: Among 1,030 shelter users, we found no association between self-reported DM and LTBI (Odds ratio, 1.22; 95% confidence interval, 0.68 to 2.20).

Conclusions: Diabetes is an important TB-related risk factor and its ascertainment can help prioritize targeted screening and intervention. We found self-reported DM did not effectively predict LTBI in our sample, suggesting it is an insufficiently reliable measurement for homeless screenings.

Sponsor: Funded by Center for Disease Control and Prevention
IRB/IACUC#: 2012-139

1326 - Poster **Classification:** SPH Student

Presenter: Grace Negedu **Department:** Environmental & Occupational Health

Authors: Uloma Uche, UNT Health Science Center; Grace Negedu, UNT Health Science Center; Alisa Rich, UNT Health Science Center

Comparison of Atmospheric Volatile Organic Compounds (VOCs) in Unconventional Shale Gas Extraction and Production Areas and the 2008/09 and 2010 U.S EPA Urban Air Monitoring Program (UATMP)

Purpose: This study analyzed if VOC levels in the atmosphere were elevated in areas of energy E&P. Results were compared to ambient air sampling data from U.S. EPA Urban Air Toxic Monitoring Program (UATMP) using 2008/2009 and 2010 data. The UATMP is the most comprehensive air monitoring program in the U.S.

Methods: Ambient air sampling occurred in 6 counties in the Dallas/Fort Worth (DFW) Metroplex from 2008 – 2010 using certified sterilized evacuated stainless steel 6 liter summa canisters. Air samples were analyzed by GC/MS (Gas Chromatography Mass Spectrometry) following U.S. EPA Compendium Method Toxic Organics (T0-14A).

Results: Ambient air sampling confirmed the presence of 106 VOCs however, 37 chemicals were comparable between the Barnett Shale study and UATMP. For 2008/09, 25 out of 37 compounds were elevated in the Barnett Shale over UATMP. Significantly elevated compounds include hexachlorobutadiene (+1429.41%), 1,2,4-trichlorobenzene (+2268.42%), m&p – xylene (3284.38%), benzene (+5432.71%), 3-methylhexane (+6000.80%), ethylbenzene (+6707.23%), 1,1,2,2-tetrachloroethane (+20,500%). For 2010, 30 out of 37 compounds were elevated in the Barnett Shale over UATMP. Significantly elevated compounds included dichlorotetrafluoroethane/F114 (+1036.36), toluene/methylbenzene (+1115.86%), tetrachloroethene/PCE (+1121.11%), ethylbenzene (+1458.62%), 1,2-dichloroethane/EDC (+1539.34%), trichloroethylene/TCE (+3302.23%), 1,3,5–trimethylbenzene (+5520.86%) hexachlorobutadiene (+7778.79%), m&P- xylene (+8085.19%), 1,2,4-trimethylbenzene (+10,647.33%), 1,1,2,2-tetrachloroethane (+17,066.67%), 1,2,4-trichlorobenzene (+20,049.25%), benzene (+21,745%).

Conclusions: This study confirms energy extraction and production contributes to elevated levels of VOCs in the atmosphere impacting ozone levels. VOCs found in this study are considered to be hazardous air pollutants (HAPs), primarily for the impact to human health. Exposure to HAPs have been associated with elevated incidence in birth defects, cancers, immune and nervous system disorders.

Sponsor: N/A
IRB/IACUC#: N/A

Immunology (Abstracts in the 1400s)

1400 - Poster **Classification:** GSBS Student
Presenter: Rudy Castillo **Department:** Institute for Cardiovascular and Metabolic Disease
Authors: Rudy Castillo, UNT Health Science Center; Lisa Hodge, UNT Health Science Center

Thoracic Duct Lymph Suppresses the Inflammatory Response of Macrophages In Vitro

Purpose: The gastrointestinal lymphatic vessels redistribute a large pool of lymph rich in immune cells, inflammatory mediators, and lipids. Recent literature suggests that during gastrointestinal injury, soluble factors released from the mesentery redistribute duct to the lung via the thoracic duct where they initiate inflammation and contribute to multiple organ dysfunction syndrome (MODS). Alternatively, normal mesenteric lymph has been shown to suppress inflammation in vivo and in vitro. Specifically, under inflammatory conditions, normal mesenteric lymph reduced the expression of cell adhesion molecules and myeloperoxidase in pulmonary tissue and reduced expression of cell adhesion molecules on pulmonary endothelial cells. However, the role of normal lymph on phagocyte function remains unknown. Importantly, macrophages have been to shown to contribute to MODS. The aim of this study was to investigate the effect of normal lymph on macrophage function. Specifically, we hypothesized that normal thoracic duct lymph (TDL) would suppress the release of inflammatory mediators by LPS-activated macrophages.

Methods: To test this hypothesis, under anesthesia the thoracic ducts of eight mongrel dogs were cannulated and lymph was collected. The TDL was centrifuged to remove cells and the TDL supernatant was frozen and stored at -80^{o}C. Murine RAW 264.7 macrophages were cultured in vitro with TDL at 0.5, 1, 2, 5 or 10% total volume per well or phosphate-buffered saline at 5 or 10% total volume per well with or without lipopolysaccharide (LPS) for 24 hours at 37°C with 5% CO_2. After incubation, cell cultures were centrifuged to remove cells and the supernatants were assayed for nitric oxide (NO) and tumor necrosis factor-alpha (TNF-a) production. Macrophage viability was measured using flow cytometry with the markers Annexin V and Propidium Iodide to distinguish live cells from apoptotic cells.

Results: TDL did not augment the production of NO_2^-, TNF-a or alter cell viability by macrophages cultured in media alone. However, when macrophages were activated with LPS, TDL suppressed the release of NO and TNF-a. Specifically, the addition of TDL at 5% total volume per well suppressed NO_2^- production (15±0.6 uM) and TNF-a production (5016±425 pg/mL) compared to LPS. Culture with LPS and/or TDL did not alter cell viability.

Conclusions: Our data suggests that during stimulation with LPS, a biological factor in lymph suppressed the release of inflammatory mediators by macrophages. Furthermore, cell viability was unaltered, suggesting that that TDL altered macrophage function. Future studies will focus on the ability of lymph to suppress the inflammatory response in disease models.

Sponsor: National Institutes of Health, R01AT004361 and Institute for Cardiovascular and Metabolic Disease
IRB/IACUC#: 2006/07-18

1401 - Poster **Classification:** GSBS Student

Presenter: Joseph D. Malaer **Department:** Graduate School of Biomedical Sciences
Authors: Joseph Malaer, UNT Health Science Center; Nathan Horton, Core Laboratory at Sonic Reference Laboratory; Porunelloor Mathew, UNT Health Science Center

Expression of Cancer Stem Cell (CSC) Specific Transcription Factors and Cell Surface PCNA and Their Role in CSC Escape From NK Cell Effector Function

Purpose: Natural Killer (NK) cells participate in the innate immune response against cancer and infection without prior sensitization. NK cell function depends on a balance of signals transmitted from activating and inhibitory receptors interacting with ligands on the surface of target cells. Cancer cells may evade NK-mediated killing by expressing or secreting ligands for NK cell inhibitory receptors. The Natural Cytotoxicity Receptor (NCR) family, comprised of NKp30, NKp44, and NKp46, is classically described as a group of activating receptors that induce NK cell activation and cytotoxicity. Notably, NKp44 functions as an activating or inhibitory receptor depending on ligand interaction. Proliferating cell nuclear antigen (PCNA) associates with Human Leukocyte Antigen I (HLA I) and forms the inhibitory ligand for NKp44, resulting in the inhibition of NK function. Cancer stem cells (CSC), a unique subset of tumor cells, possess a stem-cell-like phenotype and are thought to facilitate metastasis by escaping NK cell effector function.

Methods: Diffuse B cell lymphoma (DB) cells were labeled and sorted for cell surface PCNA expression via fluorescence activated cell sorting (FACS). Total RNA was isolated, converted to cDNA, and the transcription factors NANOG, SOX2, and Oct-4, which are associated with CSC phenotype, were analyzed by qRT-PCR from sorted PCNA+ and PCNA- cells. NK receptor-ligand interactions were blocked by incubating DB cells with anti-PCNA, anti-NKp44, or control antibodies and a chromium release killing assay was performed.

Results: Cell sorting and qRT-PCR confirmed DB cells with cell surface PCNA have increased expression of transcription factors compared to PCNA- cells. Blocking the interaction of NKp44 and PCNA enhanced the killing of DB by NK cells.

Conclusions: Cell surface PCNA is associated with increased CSC transcription factor expression. Additionally, cell surface PCNA on CSC may facilitate escape from NK cell killing by interacting with NKp44 and transmission of an inhibitory signal. Characterization of stem cell transcription factors and cell surface PCNA may provide novel immunotherapeutic targets to destroy CSC and thus prevent cancer metastasis.

Sponsor: N/A
IRB/IACUC#: 2000-704/2028

1402 - Poster **Classification:** GSBS Student

Presenter: Hannah Marvin **Department:** Graduate School of Biomedical Sciences

Authors: Hannah Marvin, UNT Health Science Center; Rudy Castillo, UNT Health Science Center; Allison Conway, UNT Health Science Center; David Rabago, University of Wisconsin School of Medicine and Public Health; Booby Nourani, University of Wisconsin School of Medicine and Public Health; Lisa Hodge, UNT Health Science Center

Culture with Dextrose Reduced Macrophage Viability in A Dose Dependent Manner: Implications for Prolotherapy

Purpose: Prolotherapy, coined from proliferant therapy, is an alternative injection-based therapy that has been used in clinical practice for over 80 years to treat various chronic musculoskeletal conditions. Modern hypotheses suggest prolotherapy promotes growth of normal cells and tissues to improve ligament mechanics, and decrease pain through inflammatory mechanisms. The most common injectant contains dextrose (D-glucose), a natural form of glucose found in the body. Recent literature indicates adults with symptomatic knee pain received the most relief from intra-articular injection of dextrose, compared to saline injections, or exercise. This study aims to begin to explain the mechanism of action of dextrose in the inflammatory response. Specifically, we hypothesized that dextrose would suppress the release of inflammatory mediators from LPS-activated macrophages.

Methods: To test this hypothesis, murine RAW 264.7 macrophages were cultured in vitro with phosphate-buffered saline (PBS) or dextrose solution at 2.5%, 5%, and 10% of total volume per well, with or without 500ng lipopolysaccharide (LPS). Twenty-four hours after incubation at 37°C with 5% CO_2, culture supernatants were stored and assayed for nitrite (NO_2^-) using Griess reagent. Macrophage viability was measured using flow cytometry with the markers Annexin V and Propidium Iodide.

Results: Dextrose did not significantly alter the production of NO_2^- in macrophages cultured without LPS. However, in LPS-activated macrophages, dextrose significantly ($p<0.05$) suppressed the release of NO_2^- compared to respective PBS controls. Specifically, 2.5% dextrose suppressed NO_2^-release by 78.31%, while 5% and 10% dextrose completely inhibited production of NO_2^- . Cell viability was also significantly ($p<0.05$) reduced by dextrose compared to respective PBS controls.

Conclusions: Dextrose reduced viability and suppressed the production of NO_2^- by macrophages in vitro. Prolotherapy may protect against inflammation by reducing the inflammatory activities of macrophages. Future studies will examine the effect of dextrose on macrophage function in vivo using animal models.

Sponsor: Institute for Cardiovascular and Metabolic Disease
IRB/IACUC#: N/A

1403 - Poster **Classification:** GSBS Student
Presenter: Olga Sizova **Department:** Cell Biology and Anatomy
Authors: Olga Sizova, UNT Health Science Center; Dong-Ming Su, UNT Health Science Center

Pro-Inflammatory Condition-Induced Tumor Dormancy in Pre-Metastatic Reservoir Thymus

Hypothesis: Cancer patients suffering from metastatic relapse is the major cause of death. This is attributed to some undetectable minimal number of tumor cells, which are able to resist radio-chemotherapy, being in dormant state at some organs of the body. The largest T-lymphoid organ, thymus, has just recently been suggested as this kind of organ to be a pre-metastatic reservoir for tumor cell dormancy, and eventually relapse. We hypothesize that infection-, drug- and aging-resulted thymic atrophy induces inflammatory conditions to create this tumor pre-metastatic reservoir.

Materials and Methods: To test our hypothesis we utilized various cancer cell lines (both human- and mouse- derived) and inoculated them into different groups of mice to see how specific tumor microenvironments (young thymus/naturally and induced involuted thymus/T-and B-cell lacking) have an effect on cancer cells retention and survival during chemotherapy.

Results: Our observations in tumor-inoculated mouse model show that various cancer cells could be retained in the thymus. This retention ratio (in the thymus vs. lymph nodes) was particularly high in the naturally-aging- or drug-caused atrophied thymus. We found that genotoxic chemotherapy (Doxorubicin) can lead to changes in thymic microenvironment, characterized by activation of p53 in thymic epithelial cells (TECs), induction of TEC senescence, and an increase of pro-inflammatory factors. These thymic conditions were able to confer tumor cell capacity to anti-apoptosis. We also found that dormant tumor cells in the thymus have a capacity to induce tumor recurrence in the distant organs.

Conclusions: Our pilot experiments suggest that activation of p53 in TECs induced by DNA-damage upon Doxorubicin treatment promotes senescence, in which SASP (senescence-associated secretory phenotype) is activated, thereby leading to tumor cell dormancy/chemo-resistance. This work is clinically relevant because our findings may help to determine a new target to prevent tumor relapse after chemotherapy.

Sponsor: N/A
IRB/IACUC#: 2014/15-45-A04

1404 - Poster **Classification:** GSBS Student

Presenter: Naomi K Swanta **Department:** Biomedical Sciences

Authors: Naomi Swanta, UNT Health Science Center; Alexandra Witter, UNT Health Science Center; Olubusola Okunnu, UNT Health Science Center; Rance Berg PhD, UNT Health Science Center

The Effect of ecSOD on HMGB1 and it's Role During Listeria Infection

Background: Listeria monocytogenes (LM) is a gram-positive, intracellular foodborne pathogen which can cause severe disease in immunocompromised individuals and is a leading cause of death from foodborne infection. During LM infection, reactive oxygen species (ROS) represent a first line of defense, which not only destroys the pathogen but can also cause collateral tissue damage. Extracellular superoxide dismutase (ecSOD) is a potent antioxidant that protects host tissue by regulating ROS concentrations. Using congenic mice that express varying levels of ecSOD, our lab has previously demonstrated that ecSOD activity decreases resistance to LM infection and pro-inflammatory cytokine production. In contrast, ecSOD enhances neutrophil recruitment to the liver during LM infection. High-mobility group box 1 protein (HMGB1) is a ROS modulated protein, which has been shown to promote neutrophil recruitment when critical cysteines are reduced but promotes pro-inflammatory responses when these residues are oxidized. We hypothesize that ecSOD activity reduces cysteine residues in HMGB1, thus enhancing neutrophil recruitment while decreasing pro-inflammatory responses during LM infection.

Purpose: The purpose of our study is to understand the effect ecSOD has on transcription, translation and post-translational modification of HMGB1. We are also studying the effect of HMGB1 on inflammatory cytokine production such as TNFa, IL-1 and IL-6 and neutrophil recruitment to infected organs during LM infection in ecSOD congenic mice.

Methods: C57BL/6 mice were infected with LM and at 3 days post infection immune cells were isolated from the spleen and bone marrow. The cells were used for rt-PCR to study HMGB1 transcription, and western blotting to study the translation of HMGB1. Furthermore, the aforementioned cells from ecSOD congenic mice were also incubated overnight with 10ng/mL of HMGB1 and supernatants were harvested to measure TNFa by ELISA.

Results: Our results indicate that LM does not have a significant effect on HMGB1 transcription and translation in the spleen and bone marrow. We also show that at 10ng/mL, HMGB1 does not enhance or induce TNFa production in spleen and bone marrow cells from ecSOD congenic mice.

Conclusions: Our results indicate that HMGB1 production is not influenced by LM infection in C57BL/6 mice. Furthermore, our data suggest that HMGB1 may not influence immune responses against LM in ecSOD congenic mice in vitro. Further studies are required to elucidate the in vivo functions of HMGB1 during LM infection.

Sponsor: NIH
IRB/IACUC#: 2013/14-25-A04

Integrative Physiology (Abstracts in the 1500s)

1500 - Poster **Classification:** GSBS Student

Presenter: Alexandria Marciante **Department:** Institute for Cardiovascular and Metabolic Disease
Authors: Alexandria Marciante, UNT Health Science Center; J. Thomas Cunningham, PhD, UNT Health Science Center

DREADD-Induced cFos Expression in the Basal Forebrain of Male Rats

Purpose: Designer Receptors Exclusively Activated by Designer Drugs, or DREADDs, are genetically modified G-protein coupled receptors (GPCR) that are sensitive to an exogenous pharmacological agent, clozapine-N-oxide (CNO). DREADDs can be packaged in viral vectors with specific promoters or combined with CRE dependent platforms to express these receptors in specific neuronal phenotypes. This chemogenetic approach can be used to activate (Gq), inhibit (Gi), or stimulate cAMP (Gs) in neurons expressing DREADD receptors. In the present study, we tested the effects of a CRE independent Gq DREADD, using a CaM Kinase (CaMKIIa) promoter, and a mCherry reporter (rAAV5-CaMKIIa-hM3D(Gq)-mCherry) on Fos staining in the basal forebrain.

Methods: Adult male Sprague-Dawely rats (250-300 g bw, Charles River) were anesthetized with isoflurane and stereotaxically injected with an AAV containing the hM3D(Gq) or a control virus (rAAV5-CaMKIIa-mCherry) in either the diagonal band of bregma (DBB) or the median preoptic nucleus (MnPO). Animals were monitored for recovery for two weeks and then administered CNO or vehicle. CNO was dissolved into dimethylsulfoxide (DMSO) and saline (ratio 20% to 80%) and given via intraperitoneal injection (IP) at a concentration of 10mg/kg. Rats were food and water deprived for 90 minutes following administration of CNO or vehicle and then perfused transcardially using 4% paraformaldehyde. Brains were harvested and placed into 30% sucrose until proper dehydration of the brain. Forebrains were then sliced into 40 micron segments using cryostat. Immunohistological techniques were performed as previously described using peroxidase staining for Fos to determine activation of the DREADD virus and fluorescent staining for mCherry to verify cells transfected with either the DREADD or control virus.

Results: Overall, rats transfected with the Gq DREADD virus and treated with CNO showed significantly elevated Fos staining in the DBB or MnPO than groups transfected with either Gq DREADD and treated with vehicle or the control virus and treated with CNO or vehicle. Those transfected with the Gq DREADD virus in the DBB and treated with CNO, showed significantly more Fos staining than those transfected with either Gq DREADD and treated with vehicle ($P<0.001$) or the control virus and treated with CNO ($P<0.001$) or vehicle ($P=0.002$). The CNO did not appear to have a significant effect on Fos staining in rats injected with the control vector. Injection of Gq DREADD virus into the DBB also appears to have less of an effect on downstream targets, specifically the paraventricular nucleus (PVN) and the supraoptic nucleus (SON), than did injection of Gq DREADD virus into the MnPO.

Conclusions: These results indicate that Gq DREADD can be used to differentially activate neurons in either the DBB or the MnPO to influence activity in downstream regions that control autonomic and neuroendocrine function.

Sponsor: P01 HL088052 **IRB/IACUC#:** 2014/05-28-805

1501 - Poster **Classification:** TCOM DO Student

Presenter: Tyler Petree **Department:** Cardiovascular Research Institute

Authors: Tyler Petree, UNT Health Science Center; Caroline Rickards, UNT Health Science Center; Hannah Colby, UNT Health Science Center; Justin Sprick, UNT Health Science Center; Victoria Kay, UNT Health Science Center

Association of Low-Frequency Oscillations In Arterial Pressure and Cerebral Blood Flow on Cerebral Oxygenation During Stimulated Hemorrhage

Background: Sustaining adequate cerebral perfusion and oxygenation are essential for maintaining consciousness. It has been shown that healthy individuals subjected to central hypovolemia show a continuum of tolerance to this stress, including simulated hemorrhage induced via application of lower body negative pressure (LBNP). Differences in tolerance to central hypovolemia have been associated with elevated release of vasoactive hormones, increased compensatory tachycardia and vasoconstriction, and higher endogenous low frequency (LF; ~0.1 Hz) arterial pressure and cerebral blood flow oscillations. We hypothesize that an increase in oscillations in middle cerebral artery velocity (MCAv) during maximal LBNP will result in an attenuated decrease in cerebral oxygenation, subsequently resulting in higher tolerance to this stress.

Methods: 25 healthy human subjects were subjected to pre-syncopal limited LBNP. Continuous waveform data was obtained for mean arterial pressure (MAP), MCAv, and cerebral oxygen saturation (ScO_2). Spectral analysis was performed on MAP and MCAv to assess oscillations in the low frequency range (LF; 0.04-0.15 Hz). Subjects were divided into “Oscillators” and “Non-oscillators” based upon the increase or decrease in LF oscillations in MAP. The % change in ScO_2 was assessed between “Oscillators” and “Non-oscillators” to determine if the presence of oscillations caused attenuated decrease in ScO_2. Coefficients of determination (R^2) were calculated between % changes in ScO_2 and LF oscillations, and % changes in ScO_2 and LBNP tolerance across all subjects.

Results: By design, MAP LF power was higher in the “Oscillators” vs. “Non-oscillators” (17.6 ± 3.6 vs. 6.5 vs. 1.3 $mmHg^2$; P=0.01). This also resulted in higher MCAv LF power in the “Oscillators” (5.9 ± 1.2 vs. 2.9 ± 0.6 cm/s^2; P=0.03). Contrary to our hypothesis, however, the “Oscillators” exhibited a greater reduction in ScO_2 vs. the “Non-oscillators” (-7.1 ± 0.7 vs. -4.1 ± 1.6%; P=0.04), but there was no difference is LBNP tolerance time between groups (Oscillators: 1558 ± 81 s vs. Non-oscillators: 1661 ± 162 s; P=0.27). There were also poor associations between % changes in ScO_2 vs. MAP LF power (R^2=0.06), and % change in ScO_2 vs. LBNP tolerance (R^2=0.001).

Conclusions: These results suggest that increased oscillations in arterial pressure and cerebral blood flow do not result in an attenuated decrease in cerebral oxygen saturation.

Sponsor: US Army MRMC
IRB/IACUC#: 2012-163

1502 - Poster **Classification:** Dual Degree student
Presenter: Grace S Pham **Department:** Graduate School of Biomedical Sciences
Authors: Grace Pham, UNT Health Science Center; Keisa Mathis, UNT Health Science Center

Differential Effects of Curcumin on Renal and Systemic Inflammation in a Mouse Model of Systemic Lupus Erythematosus

Purpose: The afferent vagus nerve, through its connection to the hypothalamic pituitary adrenal (HPA) axis, may help regulate inflammation by relaying inflammatory stimuli to prompt release of the anti-inflammatory hormone cortisol. Afferent vagal sensitivity may be diminished in chronic inflammatory diseases, such as systemic lupus erythematosus (SLE). SLE primarily affects reproductive age women, who commonly present with inflammatory kidney disease, diminished vagal tone, dysregulated HPA function, and inadequate basal cortisol. There is evidence that curcumin, the active compound of the spice turmeric, activates vagal afferent neurons, which may lead to increased HPA axis function and heightened cortisol release. We hypothesized that chronic curcumin administration (50mg/kg in sesame oil as vehicle; 4 weeks, daily; i.p.) would protect against chronic inflammation in the NZBWF1 mouse model of SLE by ameliorating HPA axis dysfunction.

Methods: At 30 weeks of age, female mice were designated into four groups (n = 4-5/group): SLE-CURC, SLE-VEH, CTL-CURC, and CTL-VEH. We measured splenic cytokines as endogenously released cortisol from the HPA aixis modulates activity of this immune organ.

Results: Splenic TNF-α and IL-1β expression (normalized to total protein) were increased in SLE mice compared to controls ($2.57 \times 10^7 \pm 4.41 \times 10^6$ vs. $1.56 \times 10^7 \pm 1.99 \times 10^6$; $p = 0.006$ and $2.76 \times 10^5 \pm 9.86 \times 10^4$ vs. $3.35 \times 10^4 \pm 2.49 \times 10^4$; $p = 0.020$). Curcumin accentuated splenic TNF ($4.85 \times 10^7 \pm 7.06 \times 10^6$; $p = 0.016$), while reducing splenic IL-1β in SLE mice ($1.36 \times 10^5 \pm 1.74 \times 10^4$; $p = 0.092$). Preliminary in vitro splenocyte data support curcumin as being pro-inflammatory in SLE. Splenocytes isolated from curcumin- and vehicle-treated SLE mice released increased TNF-α when stimulated with LPS (100 ng) or norepinephrine (50 nM), (2.76×10^5 vs. 6.88×10^4 and 4.69×10^5 vs. 1.42×10^5, respectively; n = 1/group). In order to determine curcumin's effects on kidney inflammation, we measured renal cytokine expression. SLE mice had elevated renal cortical IL-6 and TGF-β1 compared to control mice ($1.27 \times 10^5 \pm 6.16 \times 10^4$ vs. $7.49 \times 10^4 \pm 1.50 \times 10^4$; $p = 0.130$ and $1.90 \times 10^5 \pm 7.17 \times 10^4$ vs. $7.67 \times 10^3 \pm 2.58 \times 10^3$; $p = 0.006$). Curcumin increased renal cortical expression of both IL-6 and TGF-β1 in SLE mice ($3.37 \times 10^5 \pm 1.44 \times 10^4$ vs. $1.28 \times 10^5 \pm 6.16 \times 10^4$; $p = 0.128$ and $3.536 \times 10^5 \pm 1.16 \times 10^5$ vs. $1.90 \times 10^5 \pm 7.17 \times 10^4$; $p = 0.152$).

Conclusions: Taken together these data indicate that curcumin mostly yields pro-inflammatory effects in the setting of SLE, although its anti-inflammatory suppression of splenic IL-1β suggests a more complex interaction with the immune system. Additional studies are needed to investigate renal and cardiovascular outcomes. Further inquiry into vagal control of inflammation and the use of naturally derived compounds as an adjunct treatment of chronic inflammatory processes is warranted.

Sponsor: American Heart Association, Institute for Cardiovascular and Metabolic Diseases
IRB/IACUC#: 2013/14-41-A04

Microbiology / Infectious Disease (Abstracts in the 1600s)

1600 - Poster **Classification:** Pharmacy Student
Presenter: Mark Gehrig **Department:** Pharmacy
Authors: Mark Gehrig, UNT Health Science Center; Patrick Clay, UNT Health Science Center; Richard Perry, Adelphi Worldwide; Anna Hadfield, Adelphi Worldwide; Jialiang Liu, UNT Health Science Center; Sumihiro Suzuki, UNT Health Science Center

Actual Versus Perceived Use of Pharmacokinetic (Primarily Absorption) Influential OTC Agents and ART Tolerability in a Nationwide Matched Cohort of HIV Patients and Their Healthcare Providers

Background: Antiretroviral therapy (ART) for HIV patients is lifelong. ART efficacy is clear, adverse effects (AE) severity has decreased yet still impact outcomes. This study obtained 'real world' data comparing healthcare providers' (HCP) perceptions and clinic records to their patients' perceptions of ART tolerability and self-management.

Methods: Study utilized Adelphi's HIV Disease Specific Programme, a cross-sectional survey including provider interviews (n = 131) and matched HCP and patient self-completed surveys (n = 485), conducted among HIV patients and their HCPs. Similar questionnaires focused on disease symptoms, ART AEs, other AEs, compliance, impact and reasons for switching or discontinuing therapy.

Results: A total of 131 HCPs were interviewed (n = 80 ID physicians) at 18 metro areas across the US. "Efficacy" was stated by 58% of HCPs as the most important attribute when selecting ART yet the top 5 attributes for ART selection in patient charts revealed criteria of "well tolerated by patients." ID specialists perceived 32% of all patients are experiencing ART side effects and this increases with subsequent regimens. HCPs interviewed revealed diarrhea as one of the most common symptoms seen with 66% stating diarrhea was the most "most troublesome" AE. This agrees with patients, who recorded diarrhea as equal second "most problematic symptom." ART changes are most frequently for lack of virologic control (36%) but secondarily (28%) due to GI AEs. HCPs and patients agree on proportion experiencing diarrhea and being treated for it, yet only about 1/3 of patients receive therapy. Finally, our results also reported a concerning discrepancy between prevalence of OTC drugs used by patients versus perceived use by HCPs.

Conclusions: HIV patients experience and self-medicate GI symptoms disparate with HCPs knowledge, representing a potential major detrimental influence on outcomes.

Sponsor: N/A
IRB/IACUC#: 2016-048

1601 - Poster **Classification:** TCOM DO Student

Presenter: Tesneem Issa **Department:** Pediatrics

Authors: Tesneem Issa OMS-II, UNT Health Science Center; Julian Nguyen OMS-II, UNT Health Science Center; Javier Gelvez MD, Cook Children's Health Care System; Lorrainea Williams PharmD, Cook Children's Health Care System; Charity Darnell RN, Cook Children's Health Care System; Tyler Hamby PhD, Cook Children's Health Care System, UNT Health Science Center

Evaluation of the Sepsis Screening Tool's Efficacy in Assessing Organ Dysfunction

Background: Sepsis is a life threatening condition caused by the dysregulation of the immune system due to multiple organ dysfunction. It is usually caused by an infection that can affect the respiratory, neurological, circulatory, and metabolic systems. The best way to help these patients is to give them the appropriate care as quickly as possible. In order to help make this possible, a sepsis screening tool was developed for patients at Cook Children's Medical Center (CCMC).

Purpose: The purpose of this project was to see if patients screened for sepsis were less likely to develop organ dysfunction. A new adult definition of sepsis was developed in February 2016 by the European Society of Intensive Care Medicine and the Society of Critical Care Medicine; this definition, modified to apply pediatric norms, was applied at CCMC in order to assess the level of organ dysfunction in children.

Methods: The level of organ dysfunction was based on the first set of vitals at admission to the pediatric intensive care unit (PICU) at CCMC. To be included in this study, patients had to have had an initial PICU visit between the dates of 10/12-5/16, and the providers' diagnoses had to have included billing codes related to sepsis. There were 520 patients meeting these criteria. Patients were screened for respiratory, neurological, circulatory, or metabolic dysfunction, and then were given an organ dysfunction score.

Results: The results showed that 82% of the patients who were not screened had organ dysfunction compared to only 69% of those for which the sepsis screening tool was utilized. Thus, those who were not screened were more likely to have organ dysfunction than those who were screened, P=.001, OR=2.08. Among those screened, patients with positive screens (73%) were more likely to have organ dysfunction than those with negative screens (60%), P=.03, OR=1.78.

Conclusions: In conclusion, patients who were screened were significantly less likely to have organ dysfunction than those who were not screened, and among those screened, those with positive screens were significantly more likely to have organ dysfunction. The tool successfully assessed the risk of sepsis and septic shock at CCMC and could be used to increase sepsis awareness if it was to be used at other hospitals.

Sponsor: N/A
IRB/IACUC#: CCHCS IRB

1602 - Poster **Classification:** Pharmacy Student

Presenter: Zichang Liu **Department:** Pharmacy

Authors: Zichang Liu, UNT Health Science Center; Patrick Clay, UNT Health Science Center; Shara Elrod, UNT Health Science Center

Medication Adherence on People Living with HIV and AIDS with Concomitant Diabetes

Objective: The aim of this study is to determine the medication adherence rate in people living with HIV and AIDS (PLWHA) and concomitant diabetes

Methods: This retrospective review was conducted as a part of a larger study examining communication patterns between pharmacists and PLWHA using medication refill data obtained from community pharmacies between June 2014 to September 2015. Medication refill history, which included initial research participation date, prescription fill history, and day supply were collected. Patients were included in this retrospective review if they were enrolled in the study for at least 3 months, and are taking both highly active antiretroviral therapy (HAART) and antidiabetic medications. Descriptive analyses were used to determine the proportion of days covered (PDC), or the number of days that a patient has a medication for a specific period of time. PDC >80% for antidiabetic medication and PDC > 90% for HAART will be considered as adherent to medications.

Results: A total of 37 patients met inclusion criteria and were included in this review. The mean age was 53.9 years (n=36, range 20-73) and 73% (n=27) were male. The mean PDC of HAART is 97.8% and the mean PDC of antidiabetic medications is 96.4%. The mean PDC of females taking antidiabetic medications was found to be significantly lower than that of males (89.3%,100.2%, p=0.03). The mean PDC of females taking HAART was also found to be significantly lower than that of males (94.2%,99%, p=0.013). The mean PDC of patients who are younger than age 50 taking both HAART and antidiabetic medications is 93.5%, the mean PDC of patients between 50 to 60 years old taking both HAART and antidiabetic medication is 98.6%, and the mean PDC of patients who are older than age 60 taking both HAART and antidiabetic medication is 97.7%.

Conclusions: The adherence rate for females taking both HAART and antidiabetic medication was found to be significantly lower than that of males. The adherence rate is higher in ages between 50 to 60 than other age groups. Although the adherence rate varies between gender and different age groups, the overall adherence rate for both male and female reaches the goal of PDC> 80% for antidiabetic medication and PDC>90% for HAART. Future studies should examine barriers to adherence for women who have HIV and concomitant diabetes.

Sponsor: N/A
IRB/IACUC#: 2014-104

1603 - Poster **Classification:** Pharmacy Student
Presenter: Antuan Ma **Department:** Pharmacy
Authors: Antuan Ma, UNT Health Science Center; Patrick Clay, UNT Health Science Center

Oxidized LDL for the Early Detection of Atherosclerosis in Human Immunodeficiency Virus Patients on Antiretroviral Therapy

Background: Currently, HIV patients have established higher rates of cardiovascular disease compared to matched cohorts of non-HIV infected persons. Morbidity and mortality clinical trials are unlikely ever to be conducted providing which anti-HIV medications place persons at higher risks for cardiovascular risk factors. Oxidized forms of low density lipoprotein (oxLDL) can provide an earlier method of detecting the formation of atherosclerotic cardiovascular disease (ASCVD). In antiretroviral therapy (ART) treated human immunodeficiency virus (HIV) patients, ASCVD risk quantified by oxLDL levels may reveal variation in ASCVD progression between the different ART regimens. Input is being sought through this submission on project design and conduct.

Methods: We hypothesize that a cohort study methodology is the optimal design. In this proposed study, blood samples from HIV patients, matched for age, gender and past medical history, on varying similar/identical initial ART regimens for different periods of time will be attained. These samples will then be analyzed for their oxLDL levels. oxLDL levels will be compared and evaluated for trends related to characteristics such as ART, duration of HIV infection, duration of ART, gender, body weight (BMI), and lab values.

Conclusions: The goal of this study is to measure the degree of ASCVD progression in patients on one ART regimen relative to patients on other regimens. Any discovered differences can then lead to further studies on the factors of causality as well as prospective clinical trials.

Sponsor: N/A
IRB/IACUC#: N/A

1604 - Poster **Classification:** TCOM DO Student

Presenter: Alvin Nguyen **Department:** Texas College of Osteopathic Medicine
Authors: Nghia Nguyen, UNT Health Science Center; Lisa Hodge, UNT Health Science Center; Rudy Castillo, UNT Health Science Center

Thoracic Duct Lymph Suppresses Macrophage Activation after Stimulation with Lipotheichoic Acid

Purpose: Streptococcus pneumoniae is a gram positive bacterium that is a major cause of community acquired pneumonia. Lipoteichoic acid (LTA) can be found on the outermost surface of gram positive bacteria, including S. pneumoniae. These bacterial components activate macrophages to release pro-inflammatory substances, such as nitric oxide (NO), which can cause oxidative damages to bacteria. Tumor necrosis factor alpha (TNFα) is a cytokine involved in cell signaling pathways as part of the immune response. In recent studies, osteopathic manipulative therapy (OMT) was shown to protect against acute pneumonia. Our lab has demonstrated that osteopathic lymphatic pump technique (LPT) enhanced the flux of cytokines, reactive oxygen and nitrogen species in thoracic and mesenteric lymph. By enhancing lymph flow, LPT may boost the innate immune response against pneumonia. In this study, we hypothesized that factors in lymph would stimulate macrophage activity.

Methods: To test this hypothesis, thoracic duct lymph (TDL) was collected from 8 dogs before, during and after OMT sessions using the lymphatic pump technique (LPT). These lymphatic pools were labeled as baseline TDL, LPT TDL, and recovery TDL, respectively. In addition, a mouse alveolar macrophage cell line (MH-S) was used for this in vitro study. Phosphate-buffered saline (PBS), baseline TDL, LPT TDL and recovery TDL were added at 5% total volume per well. To activate macrophages LTA (100 micrograms) were added for 24 hours. The concentration of nitrite and TNF-α using were measured in culture supernatants.

Results: TDL had no effect on macrophages cultured without LTA. Following activation with LTA baseline, LPT and recovery TDL suppressed the production of NO (33%, 21% and 19% decrease, respectively) and TNFα (75%, 75% and 80% decrease, respectively) compared to macrophages cultured with 5% PBS.

Conclusions: Our results suggest that lymph suppress LTA-induced activation of alveolar macrophages. One explanation is that in healthy individuals, the gastrointestinal environment is normally immune suppressive. During OMT, these anti-inflammatory substances may be mobilized to target tissue via the lymphatic system.

Sponsor: National Institutes of Health R01AT004361, Texas College of Osteopathic Medicine
IRB/IACUC#: N/A

1605 - Poster **Classification:** Pharmacy Student

Presenter: Andrey Rybalchenko **Department:** Pharmacotherapy
Authors: Andrey Rybalchenko, UNT Health Science Center; Brenton Hall, UNT Health Science Center; Patrick Clay PharmD, AAHIVP, CPI, CCTI, FCCP, UNT Health Science Center

Characterization and Description of APPE Rotations and Their Intended Outcomes at Practice Sites with Exposure to HIV Patients

Purpose: Although the past two decades have seen significant progress and improved disease outcomes in the treatment of HIV and AIDS, the condition continues to be a significant cause of morbidity and mortality in the United States. In particular, certain population groups are disproportionately affected by the disease, indicating the need for specific targeting of treatment in order to maximize intervention effectiveness. Just as other healthcare professionals, pharmacists can play a key role in HIV interventions by facilitating pharmaceutical treatment, conducting medication therapy management, and performing other key interventions. As with any other disease state, specific training of practitioners is of great importance in the treatment of HIV and AIDS. Therefore, the availability of HIV APPE pharmacy school rotations, geographically matched to meet HIV population demand, constitutes a desirable goal.

Methods: Our project sets out to find gaps in HIV coverage which could be filled by the creation of novel clinical practice sites or HIV APPE rotations. We will be conducting a survey of ACPE accredited colleges of pharmacy APPE preceptors and collecting syllabi with the intent of identifying and characterizing APPE rotations that have exposure to HIV populations. Through varied means of outreach, we will identify points of contact at each ACPE accredited college of pharmacy in the US deemed likely to be able to most accurately and correctly provide responses to our survey. Once identified, survey recipients will receive an email with a cover letter summarizing our research goals, along with a link to complete the Qualtrics survey electronically.

Results/Conclusions: Survey results will allow us to describe areas in the US where HIV APPE rotations are offered. Following this, we will next align this geographic distribution with HIV surveillance, HIV clinician workforce supply, and CDC chronic disease and health indicators data. Collectively these representations will provide invaluable insight for colleges of pharmacy and healthcare institutions when determining where to develop/initiate clinical practice sites for clinical faculty and APPE rotations. This abstract is being submitted in order to solicit feedback on project design and methodology.

Sponsor: N/A
IRB/IACUC#: N/A

1606 - Poster **Classification:** Pharmacy Student

Presenter: Doris Truong **Department:** Pharmacy

Authors: Doris Truong, UNT Health Science Center; Patrick Clay, UNT Health Science Center; Shara Elrod, UNT Health Science Center

Adherence Rates of Antibiotic Use During Antiretroviral Therapy in People Living with HIV/AIDS

Objective: To determine frequency of antibiotic use and medication adherence to antibiotics used for opportunistic infections (OI) in people living with HIV/AIDS (PLWHA) who are taking anti-retroviral therapy (ART).

Methods: This retrospective review was conducted as a part of a larger study examining communication patterns between pharmacists and PLWHA using medication refill data obtained from community pharmacies between June 2014 to September 2015. Medication refill history, which included initial research participation date, prescription fill history, and day supply were collected. Patients were included in this study if they were aged 25 years or older, infected with HIV and received both ART and antibiotic therapy for 6 months or longer. To distinguish OI and non-OI antibiotic regimens, medications were classified according to the Guidelines for Prevention and Treatment of Opportunistic Infections in HIV-Infected Adults and Adolescents from the U.S. Department of Health & Human Services. The adherence rates of ART and OI antibiotics was determined using standard metrics of proportion of days covered (PDC), or the number of days that a patient has had a medication for a specific period of time. Satisfactory PDC value for adherence is ≥ 95%.

Results: A total of 155 patients were included in this study with a mean age of 48.8 years (range 25-73). The total proportion of males was 66.9% (n=101). Overall, 72 (46.5%) participants were taking antibiotics for OI, 106 (68.4%) subjects were taking antibiotics for non-OI infections, and 25 (16.1%) subjects were taking both therapies. More males were using OI antibiotics than females (p=0.021). There was no difference between genders with respect to non-OI antibiotic use (p=0.239). The most common antibiotic for OI was sulfamethoxazole/trimethoprim and the most common non-OI antibiotic was doxycycline. The mean PDC for ART and antibiotics for OI are 93.5% and 88.1%, respectively.

Conclusions: Antibiotic use is common for opportunistic infections and short term infections in PLWHA. Adherence to both ART and antibiotics for opportunistic infections was good overall, but less than ideal. Future interventions should be targeted at increasing adherence to ART and OI antibiotic therapies.

Sponsor: N/A
IRB/IACUC#: 2014-104

1607 - Poster **Classification:** GSBS Student

Presenter: Kelly Wilson **Department:** Biomedical Sciences

Authors: Kelly Wilson, University of North Texas Health Science Center at Fort Worth; Johnny He, University of North Texas Health Science Center at Fort Worth

Translational Regulation and Expresion of HIV-1 Nef in the Central Nervous System

Significance: With over 36.7 million people infected today with Human Immunodeficiency Virus (HIV)and 2.1 million new infections each year, HIV presents a massive public health challenge. Introduction of antiretroviral therapies, such as cART, has led to increased life expectancy of HIV patients with a corresponding increase of AIDS induced neurological dysfunction known as HIV/NeuroAIDS. This is characterized by an increase in reactive astrocytes, with up to 20% of astrocytes becoming infected during severe cases. No specific treatment has been developed for HIV/NeuroAIDS, but It is known that astrocytes act as latent reservoirs for HIV-1. Understanding of this phenomenon is in need of expansion to improve treatment options.

Purpose: We sought to provide insight into this matter, by focusing on one particular HIV-1 protein, the Negative Regulatory Factor. Nef protein is one of three completely spliced HIV-1 proteins and has been implicated in HIV latency and mutations in Nef have been associated with long-term non progressive HIV infections. This coupled with astrocytes being a site of restricted HIV replication lead to the question of how Nef expression is regulated in astrocytes when compared to regulation in T lymphocytes, which have less restricted HIV replication.

Hypothesis: We hypothesized that translation of Nef is downregulated in astrocytes in the HIV infected central nervous system.

Materials and Methods: Nef transfected SVGA (human astrocyte cell line) and 293t (SV40 large T antigen-expressing human embryonic kidney cells) were used for in-vitro studies. Western blot, Real-time PCR, and Luciferase assay were utilized to analyze protein expression, Nef mRNA levels, and transcriptional activity, respectively. Additionally, expression of Nef in astrocytes was visualized in iNef mice (Inducible Nef transgenic mice) brain tissue with immunohistochemistry(IHC).

Results/Conclusions: Preliminary results show 293t cells expressing higher levels of Nef protein than SVGA cells. Analysis of mRNA levels, transcriptional activity, and IHC of iNef brain tissue are inconclusive. Further optimization of conditions is required to obtain consistent reproducible results.

Sponsor: N/A
IRB/IACUC#: IACUC-2016-0013

Molecular Genetics (Abstracts in the 1700s)

1700 - Poster **Classification:** GSBS Student
Presenter: Viviana Mancilla **Department:** Graduate School of Biomedical Sciences
Authors: Viviana Mancilla, UNT Health Science Center; Yan Zhang, UNT Health Science Center; Katherine Durrer, UNT Health Science Center; Michael Allen, UNT Health Science Center

Gut Microbiome of Phenylketonuria Patients

Background: Phenylketonuria (PKU) is a metabolic disease caused by a mutation in the phenylalanine hydroxylase (PAH) gene, resulting in the inability to metabolize phenylalanine. Currently, the main treatment for PKU is dietary Phe restriction. Numerous studies on the gut microbiome have demonstrated impacts on overall health, and both diet and genetics have been shown to impact the composition of the gut microbiome. The gut microbiome in adult PKU patients has not yet been systematically investigated, and the ramifications of dietary Phe restriction are unknown.

Objective: Characterize the gut microbiome of PKU patients.

Materials and Methods: Gut microbial composition of 16 adult PKU patients were compared to 15 healthy adults by sequencing the 16S RNA gene v4 region using the Illumina MiSeq instrument.

Results: The dominant genera found in the gut microbiome of PKU and healthy control were Blautia and Bacteroides. When comparing the microbiome composition of healthy individuals and PKU patients, the abundance of Blautia, Corpococcus, Subdoligranulum, and Psuedonomas were increased in PKU patients, while Bacteriodes, Alistipes, SMB53, Faecalibacterium, and members of the Enterobacteriaceae family were shown to decrease in abundance in PKU patients.

Conclusions: The compositions of the PKU gut microbiome showed differences compared to that of healthy controls. This study provides valuable background information on the gut microbiome of PKU patients, which could be beneficial to the development of future treatments.

Sponsor: National PKU Alliance
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1701 - Poster **Classification:** TCOM DO Student

Presenter: Keegan Olmstead **Department:** Texas College of Osteopathic Medicine
Authors: Keegan Olmstead, UNT Health Science Center; Robert Barber, UNT Heath Science Center; Nicole Phillips PhD, UNT Heath Science Center

Case-Case Genome-Wide Association Study of Age-Related Cancer and Alzheimer's Disease

Background: Research over the past five years has strengthened in support of an inverse epidemiological correlation between Alzheimer's disease (AD) and cancer--individuals with cancer are less likely to develop AD and those with AD have reduced cancer risk. Since cancer is characterized by uncontrolled cell division, and AD by neuronal death (and limited neuronal regeneration), this inverse relationship may point to dysregulation in some common underlying pathways. Here, we aim to investigate the genetic underpinnings of this unique relationship which have not been fully explored, using a unique case-case genome-wide association study (GWAS) design between an AD and cancer cohort.

Hypothesis: We hypothesize that suggestive association signals will be observed when comparing the AD to cancer group, with the most interesting signals being those that are stronger when comparing cases-to-cases than when comparing cases-to-controls.

Methods: Genome-wide SNP data for AD, Cancer, and Control groups were created using two publically available datasets: Breast Cancer (BrCa) and Prostate Cancer (PCa) Cohort Consortium and Alzheimer's Disease Neuroimaging Initiative. Breast and prostate cancer were combined to form the Cancer group, which according to Cancer Research UK, are the most prevalent forms of adult and elderly cancers. All samples were typed with the Illumina Human610-Quad BeadChip. Rigorous data management and quality control measures were taken: group matching, updating map location, permutations test, sex check and filtering of low genotyping individuals and loci as well as loci with HWE issues. Three association analyses were performed: AD–Control, Cancer–Control, and AD–Cancer.

Results: After matching for age, gender, and Caucasian ethnicity 492 individuals were included in the AD group (Avg age: 75 years, 37% female), 691 individuals in Cancer group (Avg age: 67.7 years, 37% female), and 1150 individuals in the combined Control group (avg age: 71 years, 37% female). Association analysis of the AD–Cancer study indicated one marker, rs2075650, as significant at $p < 5x10^{-8}$. Initial analysis also indicated possible clustering of significant SNPs on chromosomes 8 and 11.

Conclusions: Case-case GWAS provides a novel means for identifying novel loci involved in the dichotomous relationship of risk of AD and risk of BrCa/PCa. These signals may point to critical genomic regions involved in age-related pathologies of cancer and AD.

Sponsor: N/A
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1702 - Poster **Classification:** Pharmacy Student (Not for Competition)
Presenter: Kassie Pfluger **Department:** College of Pharmacy
Authors: Kassie Pfluger, UNT Health Science Center; Annesha White, PharmD, MS, PhD, UNT Health Science Center; John Licciardone, UNT Health Science Center

Pharmacogenomic Determinants of Concomitant Opioid Use in Chronic Low Back Pain Patients: A Preliminary Review

Purpose: The aim of this study is to provide pharmacogenetic information on opioid user profiles to better understand the inter-individual variability in drug response and provide guidance to healthcare providers. One of the major mechanisms of opioid metabolism is through hepatic cytochrome P-450 CYP2D6 enzymatic activity which predominately converts codeine to morphine and then morphine-6-glucuronide leading to therapeutic analgesic effects. The association of the CYP2D6 metabolizer phenotypes with formation of morphine via this pathway is well known. Codeine serves as a Prototype for Opioid Metabolism and Analgesia. The “extensive metabolizer” phenotype represents patients who experience normal analgesia at recommended opioid doses. However, the three other CYP2D6 metabolizer phenotypes present clinical challenges in opioid prescribing. At one end of the spectrum, “ultra-rapid metabolizers” are at high risk of opioid toxicity due to increased conversion of codeine to morphine. Alternatively, “poor metabolizers” lack opioid response because of decreased conversion to morphine. However, such patients may paradoxically experience opioid side effects if the dose is increased in efforts to achieve analgesia. Finally, “intermediate metabolizers” may not achieve adequate analgesia at recommended opioid doses and must be closely monitored to balance potential benefits and risks of therapy. Pharmacokinetic and pharmacodynamic studies of opioids such as tramadol and oxycodone similarly show that these drugs depend on CYP2D6 for conversion to active metabolites responsible for analgesia.

Methods: DNA Genotyping using Scanner (Illumina) and precision medicine array. CYP2D6, CYP2C9 and CYP2C19 SNP panels, and the genotypes for all SNPs within these three genes are specifically mined from the microarray data for the purposes of risk characterization and cohort grouping.

Results/Conclusions: Patients enrolled in the PRECISION TEXAS Pain Registry provide updated data to the baseline information. Selected baseline characteristics of the 40 registry patients enrolled during the first three months of low-intensity operation are available, including scores for pain intensity (11-point numerical rating scale), back-specific functioning (Roland-Morris Disability Questionnaire), quality of life (Patient-Reported Outcomes Measurement Information System-29 [PROMIS- 29]), pain catastrophizing, and pain self-efficacy.

Sponsor: N/A
IRB/IACUC#: 2015-169 N/A

1703 - Poster **Classification:** GSBS Student

Presenter: Casandra Setser **Department:** Forensic and Investigative Genetics

Authors: Casandra Setser, UNT Health Science Center; Deanna Cross, UNT Health Science Center; Ranajit Chakraborty, UNT Health Science Center; John V. Planz, UNT Health Science Center; Arthur Eisenberg, UNT Health Science Center; Robert Barber, UNT Health Science Center

Genetic Differentiation of Hispanic Populations Using Ancestry Informative Markers

Hypothesis: There are at least 10,500 unidentified human remains in the US as of August 2015, with 2,041 of presumed Hispanic origin (NamUs 2015). Conventional DNA analysis identifies an individual through comparison with reference profiles. For those with no reference, panels of ancestry informative single nucleotide polymorphisms (SNPs) exist (Kidd 2014, Seldin 2009), but they focus on global differentiation and are not useful for ancestry determination of admixed populations (e.g. Hispanics). We hypothesize that a small panel of SNPs ascertained from appropriate populations with great genetic differentiation can distinguish ancestry within Hispanic populations.

Materials: This bioinformatics study uses the Genomic Origins and Ancestry in Latinos (GOAL) data set of 250 individuals with ancestry from Columbia, Cuba, Dominican Republic, Haiti, Honduras, or Puerto Rico, genotyped using the Affymetrix 6.0 chip to develop an informative Hispanic SNP panel.

Methods: Starting with 897,336 SNPs, we trimmed to 531,878 SNPs using linkage disequilibrium of 0.7. We then calculated pairwise F_{ST} for each SNP with each population pair using PLINK software (Haiti excluded). SNPs that met the 0.15 threshold for the four comparisons were included in a 1217 SNP panel. We used STRUCTURE to visualize population separation. To determine if a smaller SNP set could be utilized while retaining information, we used the SNPs with the top ten mean F_{ST} values from each population plus five extra to try to distinguish Cuba vs. Dominican Republic for a condensed panel of 56 SNPs. Additionally, we combined 1000 Genomes and GOAL data to verify whether the countries differentiate ancestrally or geographically.

Results: STRUCTURE analysis showed Honduras was easily distinguished from other countries in the 1217 and 56 SNP panels. Other countries were also separated based on contribution from ancestral populations; however, the separation was less than ideal. Notably, Honduras contributed 71% of the SNPs in the 1217 panel. When analyzed with 1000 Genomes data, Honduras separated with the Chinese population for K=1-3, but was the first GOAL population to separate from the ancestral line.

Conclusions: Utilizing an efficient SNP panel consistently separated Honduras from other populations demonstrating proof of concept. Greater separation of country of origin may be seen with a larger data set and alternative selection of each population's number of SNPs by a cumulative mean F_{ST} threshold.

Sponsor: N/A
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1704 - Poster **Classification:** GSBS Student

Presenter: Santosh Thapa **Department:** Institute for Molecular Medicine

Authors: Santosh Thapa M.Sc., UNT Health Science Center; Yan Zhang Ph.D., UNT Health Science Center; Elizabeth Mitchell M.S., UNT Health Science Center; Michael S. Allen Ph.D., UNT Health Science Center

Bacterial Microbiome of the Lone Star Tick, Amblyomma Americanum, from Arkansas, United States

Objective: Amblyomma americanum (the Lone Star tick), an aggressive, human-biting tick abundant in the southern, central, and eastern regions of the United States, is an important vector for many bacterial pathogens, including Rickettsia, Ehrlichia, and Francisella spp. Additionally, these ticks harbor many commensals and symbionts. The state of Arkansas has a disproportionately high incidence of several tick-borne, bacterial diseases. In order to better understand the community structure in which both pathogenic and non-pathogenic, tick-borne bacteria exist, we characterized the bacterial microbiome of A. americanum ticks collected from multiple sites in Arkansas. In addition to knowing the underlying bacterial communities within these ticks, the resultant data provide information which can potentially be useful in establishing effective interventions to control tick-borne diseases.

Materials and Methods: Genomic DNA was extracted from a total of 87 questing A. americanum ticks (42 females, 21 males, and 24 nymphs) collected in Arkansas during April-June 2015, and the V4 hypervariable region of the 16S rRNA gene was targeted using the Illumina MiSeq® sequencing platform to investigate the tick bacterial microbiomes. Raw sequence data were processed with open access mothur software. Sequences with 97% similarity were grouped into operational taxonomic units (OTUs) and assigned to differenct taxonomic levels by matching to the Greengenes database.

Results: The genus Coxiella, which includes a commonly found bacterial endosymbiont, was detected in all ticks tested, with variable distribution among the females (80%), males (0.17%) and nymphs (65%). The genus Rickettsia, which contains several known pathogens, was detected in all nymphal tick pools (0.10% to 0.90%) and about half of the female ticks (0.20% to 2.10%) but was not found in any males. Of interest, more than three-fourths of the male ticks had high abundance of unclassified bacteria within the Enterobacteriaceae family, while few females carried this group of bacteria.

Conclusions: These data demonstrate that differences in the bacterial communities are present, when comparing both life stage and sex of A. americanum ticks from Arkansas. The female ticks exhibited significantly less bacterial diversity and contained numerically dominant levels of Coxiella spp. bacteria, when compared to the males.

Sponsor: N/A
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Neuroscience (Abstracts in the 1800s)

1800 - Poster **Classification:** Pharmacy Student
Presenter: William Howell Davis **Department:** College of Pharmacy
Authors: William Davis, UNT Health Science Center; Brina Snyder, UNT Health Science Center; Rebecca Cunningham, UNT Health Science Center

Mild CIH Does Not Induce Cell Loss in the Substantia Nigra

Purpose: Sleep apnea severity has been associated with Parkinson's disease (PD) severity in men. Chronic intermittent hypoxia (CIH) is an animal model for sleep apnea. Mild CIH increases oxidative stress (OS) and inflammation in substantia nigral dopamine neurons, a neuron type lost in PD. Currently there is no model for early stage PD, wherein cell loss is not evident. Clinical symptoms of PD are not observed until about 80% of the substantia nigra (SN) is lost. It is unknown what causes PD, nor is there a cure for PD. The purpose of this study was to determine if CIH impacted neuronal viability in the SN in order to establish an early stage PD model.

Methods: Gonadally intact male Sprague Dawley rats were exposed to either room air (normoxia) or six-minute chronic intermittent hypoxia (CIH) cycles, during which oxygen levels were rapidly decreased from 21% to 10% then returned to normal room air levels, eight hours a day during the light phase for seven days. Animals were perfused and brain tissue containing the SN was prepared for 8-OhDg (OS damage marker) and DAPI (cell nuclear marker) immunohistochemical staining. Afterwards, tissue sections were mounted and imaged to analyze the specific effects of CIH on OS damage, cell nuclear size, and cell number. Specifically, 8-OhDg and DAPI expression within the SN were summed and averaged across multiple sections of the SN. Comparisons were made between normoxia and CIH groups. In addition to OS damage and cell number, cell nuclear sizes were quantified and averaged across sections. 8-OhDg and DAPI staining were visualized using a digital camera on fluorescent microscope.

Results: CIH increased OS, as shown by increased 8-OhDg expression, in the SN compared to normoxia. No significant differences in cell number or cell nuclear size were found between CIH and normoxia.

Conclusions: This is the first study to show that mild CIH does not alter SN cell number or nuclear size, even though CIH increases OS damage in cells. These results support the use of CIH as an early stage animal model for PD. Data generated from this model aid in the understanding of the PD and its pathophysiology.

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1801 - Poster **Classification:** TCOM DO Student

Presenter: Christopher Durand **Department:** Pediatrics

Authors: Christopher Durand, UNT Health Science Center; Tyler Hamby, UNT Health Science Center; Warren Marks MD, Cook Children's Medical Center; Mary-Ann Reed MS, CNRN, Cook Children's Medical Center; Brian Aalbers DO, Children's Mercy Hospital and Clinics; John Honeycutt MD, Cook Children's Medical Center

A Case Study of Deafness-Dystonia-Optic Neuropathy & Treatments

Purpose: DDON, also known as Mohr-Tranebjaerg syndrome is an inherited disorder of an Xp22 mutation of the mitochondrial transport protein TIMM8A. This mutation leads to progressive dystonia, otic neuropathy, and visual disturbances. Most patients will progress to dementia by early adulthood.

Methods: We report on a teenage male with DDON and the treatments he received at Cook Children's Medical Center (CCMC).

Results: A 15-year-old patient with a prior diagnosis of DDON presented to CCMC for treatment of worsening dystonia. He communicated by gesture and sign language, and relied on a iPad. His increasing dystonia made him incapable of communicating effectively, particularly dystonia of the upper extremities. He was was previously treated with botulinum toxin chemodenervation, however, that treatment had lost efficacy as a relief of dystonia. He received Deep Brain Stimulation (DBS) of the globus pallidus internus (GPi). Since receiving DBS implants, several programming adjustments have been made and have led to a decrease in severity of symptoms. The patient was also started on a trial of baclofen to decrease muscle dystonia. Following a good response to trial, the patient was implanted with an intra-thecal baclofen pump (ITB) to decrease the dystonia of the trunk and lower extremities that had progressed. Over five years of treatment, scores on disability scales such as the Burke-Fahn-Marsden dystonia scale have slowly worsened as the disease has progressed. Concern was expressed about efficacy of the treatment, so a trial of observed time without DBS was performed. Marked worsening of disability was noted, showing that therapy has slowed the progression of this patient's disease. Future care includes monitoring of DBS implants and transitioning care to another provider closer to the patient's home.

Conclusions: This is the fourth known case of DBS used in DDON treatment. This is also the first reported combination of ITB and DBS. Compared to other cases, this patient's outcomes with DBS have not been as marked, due to some unique brain anatomy. ITB is a unique treatment for DDON and has shown some of the most efficacious results for this patient.

Sponsor: Summer Research Fellowship Award
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1802 - Poster **Classification:** Postdoctoral Fellow

Presenter: Gef Farmer **Department:** Institute for Cardiovascular and Metabolic Disease
Authors: George Farmer Jr, UNT Health Science Center; Joel Little Jr, UNT Health Science Center; Martha Bachelor, UNT Health Science Center; Tom Cunningham, UNT Health Science Center

AT1aR Dependent GABAa Inhibition in the MnPO

Background: The median preoptic nucleus (MnPO) receives input from other circumventricular organs (e.g. SFO and the OVLT) sensitive to circulating Angiotensin II (Ang II) and plasma Na+ concentrations suggesting an involvement in hydromineral balance and blood pressure regulation. Additionally, evidence suggest the SFO synthesizes Ang II and releases it on the MnPO as a neurotransmitter suggesting the role of the MnPO in hydromineral balance and blood pressure regulation is mediated in part by Ang II. The Ang II activation of AT1aR has also been shown to influence the function of GABAaRs though the mechanisms are still unclear. Here we investigate the role of Ang II signaling via the AT1aR in the MnPO and its influence on excitatory/inhibitory balance.

Methods: Male Sprague-Dawley rats received infusions of an AAV construct containing GFP reporter and shRNA against AT1aR (shAT1a) or a shRNA scramble (shScr) targeted to the MnPO. Two weeks following AAV infusion, slices containing the MnPO were cut using standard in vitro slice procedures followed by loose patch recordings obtained from GFP labeled neurons. Spontaneous action potential firing was recorded in response to focal application of Ang II or muscimol. Additionally, activity of MnPO neurons in response to muscimol was observed in the presence of a PLC or PKC activator. The GABAa mediated effects in AT1a KD were compared to acute blockade of AT1aRs in rats that did not receive AAV infusions. Western blot and RT-qPCR analyses were used to investigate the effect of AT1a KD on GABAa and KCC2 protein and mRNA expression.

Results: Brief focal application of Ang II produced a time dependent increase in spontaneous firing of MnPO neurons. The Ang II dependent enhancement of spontaneous activity was blocked by bath application of the AT1aR antagonist Losartan. Additionally, Ang II failed to alter firing rate of MnPO neurons in shAT1a KD rats. In control animals, the GABAa agonist muscimol decreased action potential activity. In rats that received microinjections of the shAT1a muscimol failed to decrease action potential activity. In AT1a KD rats, RT-qPCR analysis shows a reduction in AT1a and KCC2 mRNA but no reduction in GABAa Beta subunit mRNA.

Conclusions: The current findings demonstrate Ang II dependent increases in the excitability of MnPO neurons are mediated by activation of AT1aRs. Moreover, AT1aRs activation also mediates the inhibitory effects of GABAaR activation. The current study suggests the reduction in GABAa dependent inhibition following AT1a KD is mediated by a down regulation of KCC2 and subsequent disruption of intracellular Cl- homeostasis. AT1aR function can modulate the balance of excitatory and inhibitory activity within the MnPO and efferent nuclei involved in the regulation of blood pressure and hydromineral balance. However, mechanisms underlying the dual excitatory/inhibitory functions of AT1aR activation remain unclear.

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1803 - Poster **Classification:** School of Health Professions Student
Presenter: Madeline McEwen **Department:** Physical Therapy Program
Authors: Jamie Guzman SPT, UNT Health Science Center; Madeline McEwen SPT, UNT Health Science Center; Ralph Cooper SPT, UNT Health Science Center; Howe Liu PT, PhD, MD, UNT Health Science Center

The Effect of Music on Gait Pattern for Patients with Parkinson's Disease

Introduction: Reports have shown that music therapy can help patients with Parkinson's Disease who often demonstrate difficulty ambulating. However, it is unclear how music therapy can work for this patient population. The purpose of this literature review is to identify specific music therapy parameters used such as genre of music, frequency, and length of treatment sessions and analyze how each were implemented to improve ambulatory ability in patients with Parkinson's Disease.

Methods: Research was conducted through PubMed resulting in nine applicable articles in the last ten years which included two systematic reviews, six randomized control trials, and one cohort study. Inclusion criteria are subjects with Parkinson's Disease, ambulatory without physical assistance, and living in community. Exclusion criteria are visual or auditory deficits.

Results: Music genre used in these studies were Renaissance (four studies), Classical (one study), German folk (three studies), jazz (one study) and music with an underlying metronome beat (three studies). The most frequently used type of music was instrumental with a definitive beat (six studies) that was familiar to the subject (three studies), resulting in significant improvements in gait stride, cadence, and step length (nine studies). Subjects listened to music via headphones or speaker (five headphones, one speaker, others not specified). Compared to their gait speed baseline (GSB), subjects performed best when the music frequency was increased by ten percent (five studies). One of the most important factors of music therapy is the use of familiar music, which results in minimal cognitive demand to synchronize gait (four studies). In terms of therapy parameters, the length of each intervention session lasted thirty to sixty minutes with thirty minutes being the most often used (seven studies); the frequency was one to three times per week with three times per week as the most selected (five studies); and the entire duration of the therapy ranged from one to thirteen weeks with three weeks as the most common.

Conclusions: The quality of music that will promote gait initiation and improve gait parameters in patients with Parkinson's Disease include the following: familiarity, instrumental music, definitive beat, headphone delivery, and GSB increased by ten percent. The most common selected intervention parameters are thirty minute sessions, three sessions per week, for a duration of three weeks.

Sponsor: N/A
IRB/IACUC#: N/A

1804 - Poster **Classification:** GSBS Student

Presenter: Ella A. Kasanga **Department:** Pharmacology & Neuroscience

Authors: Ella Kasanga, UNT Health Science Center; Tamara McInnis, UNT Health Science Center; Tanya Chotibut, Louisiana State University Health Science Center Shreveport; Samantha Meadows, Binghamton University—SUNY; Christopher Bishop, Binghamton University—SUNY; Michael Salvatore, UNT Health Science Center

Ceftriaxone, a Beta-Lactam Antibiotic, Reduces the Severity of L-DOPA-Induced Dyskinesia in a Rat Model of Parkinson's Disease

Purpose: Levodopa (L-DOPA) therapy remains the most pharmacologically used agent for the management of Parkinson's disease (PD). However, chronic treatment with L-DOPA leads to debilitating dyskinesias in 50% of Parkinson's disease patients after 5 years and ~90% after 10 years. Delineating the mechanisms of L-DOPA-induced dyskinesia (LID) is therefore a major priority for alleviating this debilitating side effect of L-DOPA. There is evidence for increased glutamate signaling in LID and in PD. However, glutamate receptor antagonists in the PD patient have achieved mixed clinical outcomes with untoward side effects. Therefore, an alternate intervention targeting the elevated glutamatergic signaling could prove useful. The beta-lactam antibiotic, ceftriaxone, increases the expression of glutamate transporter 1 (GLT-1), a transporter that plays a major role in glutamate clearance in the central nervous system. We have recently shown that ceftriaxone when given at the time of 6-hydroxydopamine (6-OHDA) injection resulted in an attenuation of tyrosine hydroxylase (TH) loss, an increase in GLT-1 expression and reduced serine-19 TH phosphorylation, a calcium-dependent target specific for nigrostriatal neurons. In this study, we determined if ceftriaxone therapy initiated 7 days after 6-OHDA, but prior to L-DOPA, could reduce L-DOPA-induced abnormal involuntary movements (AIMS) in an established L-DOPA-induced dyskinesia model.

Methods: Ceftriaxone (200 mg/kg, i.p., once daily for 7 consecutive days) was initiated 7 days post-6-OHDA lesion (days 7-13) and then continued every other week (days 21-27, 35-38) until the end of the study (day 38 post-lesion, 20 consecutive days of L-DOPA).

Results: Preliminary results show reduced AIMs at the time points 1, 4 and 7 days after the initiation of L-DOPA treatment upon the administration of ceftriaxone with a significant reduction ($p<0.01$) observed at 7 days. We also observed a reduction in amphetamine-induced rotations (ipsilateral to the lesion) in the ceftriaxone treated group on day 14 while an increase in the rotations were observed in the vehicle group, suggesting that ceftriaxone mitigated lesion severity in conjunction with reducing LID.

Conclusions: Intermittent delivery of a ceftriaxone regimen prior to and after L-DOPA may reduce LID severity, possibly in conjunction with a reduction in nigrostriatal lesion severity during the time course of ceftriaxone administration.

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1805 - Poster **Classification:** Postdoctoral Fellow
Presenter: Manish Kumar **Department:** Pharmacology & Neuroscience
Authors: Manish Kumar, UNT Health Science Center; Nigam Mishra, UNT Health Science Center; Kyle Emmitte, UNT Health Science Center; Glenn H. Dillon, UNT Health Science Center

Development Of Novel Muscle Relaxant Compounds

Purpose: Generation of a more potent muscle relaxant compound, with less abuse potential.

Materials and Methods: Whole cell patch clamp electrophysiology technique, HEK-t stable cell line expressing H-α1β2γ2s, H-α2β2γ2s and R- α3β2γ2s, cell culture, gravity based rapid drug application system, drug synthesis via a matrix approach.

Summary: The carbamate derivative carisoprodol (trade name Soma) is a widely prescribed skeletal muscle relaxant. Its recreational use is an increasing problem. Consequences of abuse include withdrawal symptoms, delusions, seizures and even death. Consequently, in 2012 carisoprodol was classified at the federal level as a schedule IV controlled substance. Its primary metabolite, meprobamate is also a controlled substance, and there remains a pressing need for efficacious muscle relaxants with reduced potential for abuse. Both carisoprodol and meprobamate act on GABAA receptors, the predominant inhibitory neurotransmitter receptor in the central nervous system, in a subunit-dependent manner. Work in recent years has shown that receptors expressing the α1 subunit are associated with anticonvulsive, sedative, and anxiolytic properties, whereas those expressing α2 and α3 subunits are associated with muscle relaxant properties. Here, using whole cell patch clamp electrophysiology, we are assessing the α subunit-related allosteric modulatory and direct gating effects of a series of compounds prepared via a matrix approach and surveying different alkyl substituents at the two positions of the carisoprodol molecule, with the goal of identification of a molecule likely to be efficacious for muscle relaxation, but with a reduced abuse potential profile.

Conclusions: Studies to date indicate structural differences at the two positions of the carisoprodol molecule lead to differences in the allosteric modulatory and direct gating effects of the ligands on GABAA receptors. Subsequent testing in animal models will help to identify lead molecules for further development. As the GABAA receptor is a target for several therapeutic classes of drugs, other indications are also possible.

Sponsor: N/A
IRB/IACUC#: N/A

1806 - Poster **Classification:** Postdoctoral Fellow

Presenter: Shao-Peng Lin **Department:** Pharmacology & Neuroscience

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Artemisinin Protects Oxidative Stress-Induced Neuronal Apoptosis Via Up-Regulation of Akt/Bcl-2 Signaling

Purpose: Artemisinin is a powerful anti-malarial drug that has been in use for decades. Recently, the novel biological effects of artemisinin on cancer, inflammation-related disorders, and cardiovascular disease were reported. The aim of this study was to explore the neuroprotective actions of artemisinin.

Methods: The model of glutamate-induced oxidative injury in HT22 hippocampal cells was established to simulate cellular ischemic model. We investigated the effect of artemisinin on oxidative stress-induced cell apoptosis death and the activity of Akt/Bcl-2 pathway in HT22 cells.

Results: Pretreatment with artemisinin attenuated reactive oxygen species (ROS) generations, preventing the decline of mitochondrial membrane potential and rescued the HT22 cells form glutamate-induced apoptosis death. The Akt/Bcl-2 pathway was activated by artemisinin in time dependent manner. Furthermore, the artemisinin inhibitor MK2206 blocked the neuroprotective effect of artemisinin.

Conclusions: Artemisinin protects neuronal HT22 cell from glutamate-induced oxidative injury and apoptosis via Akt/Bcl-signaling, thereby might be applicated for clinical neurological therapy.

Sponsor: N/A
IRB/IACUC#: N/A

1807 - Poster **Classification:** Dual Degree student

Presenter: Victor Lin **Department:** Pharmaceutical Science

Authors: Victor Lin, UNT Health Science Center; Antos Shakhbazau, UNT Health Science Center; Ashwini Zolekar, UNT Health Science Center; Jack Wang, UNT Health Science Center

A High Throughput and Integrative Approach to Evaluating the Functional Significance of a Glycosidase NGLY1 in Human Brain Development

Background: Mutations of the NGLY1 gene, leading to NGLY1 deficiency and associated neurodysfunction in pediatric patients, have been identified as the cause of a previously undiagnosed congenital disorder of deglycosylation. Despite the identification of the causal mutations, how NGLY1 deficiency disturbs normal cerebral development and causes neurological abnormalities is unknown.

Purpose: Our desire is to unravel the mystery behind this novel disease and how it influences the assembly and function of the human cerebral landscape. Further, our hope is to develop mid-to-high throughput platforms that can be applied to discover and test druggable targets for this disease and adapted for associated neurocognitive or neurodegenerative disorders.

Methods: Using human induced pluripotent stem cells (hiPSCs) and the state-of-the-art gene editing technology, CRISPR-Cas9, NGLY1 deficient human pluripotent stem cells (hPSCs) were created and used to elucidate the disease pathophysiology. In succession, middle-to-high throughput platforms were applied to recapitulate the disease in 2D and 3D, used in tandem with systems biology and novel imaging capabilities to discover new understandings and the importance glycosylation states for cerebral development and function.

Results: The CRISPR-Cas9 mediated knockout of NGLY1 was confirmed by DNA sequencing and a biochemical test. Our optimized two-dimensional and three-dimensional differentiation protocols for neurogenesis in the control and NGLY1-deficient hESCs and hiPSCs showed that the loss of NGLY1 appears to have a negligible impact on the viability and cellular pluripotency in undifferentiated hPSCs. Neuroepithelial differentiation can be successfully generated in both control and NGLY1-deficient hPSCs, suggesting that the commitment of hPSCs to the neural lineage is not profoundly hindered by the loss of NGLY1 activity. However, compared with the differentiated derivatives of control hPSCs, the derivatives from neural differentiation in NGLY1-deficient hPSCs showed noticeably increased apoptosis, suggesting that NGLY1 activity may play a critical role in the viability of neural progenitor cells, as well as, play a role in the success of their subsequent differentiation into neuronal or astroglial lineages.

Conclusions: We have built a new and unique model that can recapitulate the early-stage neurodevelopment patterns associated with NGLY1 deficiency. Using systems biology and imaging approaches, we are uncovering unprecedented insights into this newly identified disease. With the hiPSC and CRISPR-Cas9 gene editing, we demonstrate how regenerative medicine and genetic engineering approaches can be applied to studying the pathogenesis of human hereditary disease, applied in like to understand other brain pathologies, and possibly assist in the discovery of new therapeutics.

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1808 - Poster **Classification:** Postdoctoral Fellow

Presenter: Richa Pandey **Department:** Cell Biology and Anatomy

Authors: Richa Pandey Ph.D., UNT Health Science Center; Anuja Ghorpade Ph.D., UNT Health Science Center

Alcohol Influences HAND Via Astrocyte-TLR4 and cPLA2 Signaling

Background and Objective: Over the past few decades, ~25 million people died with human immunodeficiency virus (HIV)-1 disease. About 70% of HIV patients suffer from HIV-associated neurocognitive disorders (HAND). The prevalence of alcohol abuse among HIV-1+ve individuals is estimated to be 2-3 times that of the general population in the USA. HIV patient brains harbor up to 20% HIV-infected astrocytes, thus making them critical players in HAND. Previously, we reported that HIV-1 &/or alcohol (EtOH) activated astrocytes induced inflammation via cytosolic phospholipase A_2 ($cPLA_2$) activation. How EtOH regulates HIV-1-mediated inflammatory episodes initiated at the cell surface level is still unclear. Toll-like receptor (TLR) signaling in immune cells, astrocytes, microglia and neurons may play roles in pathogenesis of multiple diseases including HIV-1.

Hypothesis: We propose that TLR4 may serve as critical regulator of alcohol-mediated inflammatory responses in HAND directly or by controlling $cPLA_2$ signaling.

Materials and Methods: To investigate the temporal order of events, primary human astrocytes were cultured and treated with HIV-1 (10ng/ml) and/or EtOH (50mM). TLR4, COX2 and CCL2 mRNA levels were measured by RT^2PCR at 8h whereas protein levels were analyzed by ELISA, western blot and immunocytochemistry on 24h. We also explored the phosphorylation studies of $cPLA_2$ and TLR4 downstream molecules such as IRAK4 and NF-kB by western blot and immuno-staining analysis on 30 min. TLR4-RNAi and $cPLA_2$-specific inhibitor AACOCF3 were employed to carried out TLR4 and $cPLA_2$-specific responses.

Results: We showed EtOH, HIV-1, IL-1b and anti-retroviral (ARV) drugs significantly upregulated TLR4 in human astrocytes. Our results established that EtOH+/- HIV-1 activated TLR4 signaling leads to IRAK4 phosphorylation followed by NF-kB activation, ultimately leading to excessive production of inflammatory mediators such as COX2 & CCL2. EtOH &/or HIV-1 increased inflammatory molecules in MyD88-dependent manner. TLR4-RNAi studies reversed EtOH &/or HIV-1-regulated effects. Moreover, on silencing TLR4, the increase in EtOH+/-HIV-1-induced $cPLA_2$ phosphorylation was not observed.

Conclusions: Our study demonstrated that TLR4 regulates inflammatory responses in primary human astrocytes directly or by controlling $cPLA_2$ cascade in HAND. Hence, TLR4 could be the critical regulator of alcohol-induced astrocyte inflammation with HIV-1.

Sponsor: N/A
IRB/IACUC#: 2007-121

1809 - Poster **Classification:** GSBS Student

Presenter: Micheal Cuellar **Department:** Institute for Healthy Aging

Authors: Charity Smith B.S., UNT Health Science Center; Jo Contreras B.S., UNT Health Science Center; Rebecca Cunningham, UNT Health Science Center; Callie Fort*, UNT Health Science Center; Elric Michael Cuellar*, UNT Health Science Center; Gladys Lopez, UNT Health Science Center; Daniel Metzger, UNT Health Science Center; Anthony Oppong-Gyebi, UNT Health Science Center; Derek Schreihofer, UNT Health Science Center

Androgen Receptors in the Middle Aged Male Rat Brain: Influence of Testosterone Deprivation on Expression

Purpose: 1) To determine whether long-term testosterone deprivation (LTTD) alters the levels and/or distribution of androgen receptors in the middle-aged male rat brain and 2) to determine whether testosterone replacement after LTTD influences androgen receptor levels.

Methods: Twelve-month old male Fischer 344 rats were left intact or castrated for 2 weeks and replaced with subcutaneous implants containing testosterone (STTD). Additional groups were castrated for 10 weeks before being treated with testosterone (LTTD+T) or cholesterol (LTTD). Four weeks later, rats were euthanized and brains were collected for immunoblotting and immunohistochemistry (IHC) for androgen receptors (AR) using antibodies targeting the N-terminus or C-terminus of the protein. The cerebral cortex, hippocampus, thalamus, hypothalamus were examined, and testes were used as positive control tissue.

Results: Contrary to expectations, the full-length AR (116 kDa) was barely detectable in the hippocampus and cerebral cortex by immunoblotting with antibodies directed to either end of the AR. Rather, smaller fragments were readily detected. Examination of the size of these fragments (~30, 37, 50, and 80 kDa) and consultation of the literature for the human AR, suggested that they represented calpain-dependent cleavage fragments. A series of control experiments was performed in an attempt to extract the full-length AR using rat testes as a positive control tissue. Protease inhibitors, EDTA, and the AR agonist dihydrotestosterone failed to reduce the appearance of fragments. Interestingly, the pattern of fragments from the hippocampus (80 > 37 kDa) differed from that from the cortex (37 > 80 kDa) suggesting differential processing. IHC of coronal brain sections though the forebrain revealed nuclear AR staining consistent with full-length AR in regions of high expression, including the hypothalamus. In agreement with immunoblotting AR staining in the cortex and hippocampus appeared to be cytoplasmic, rather than nuclear. No significant differences were observed between treatment groups.

Conclusions: These data suggest that AR protein in some areas of the middle-aged male rat brain is rapidly degraded into fragments with altered localization and potential for transcriptional activity and/or signaling functions. Although no differences in expression were apparent between treatment groups, the differential processing of AR in the rat brain is a novel finding warranting further investigation.

Sponsor: NIH, National Institutes on Aging
IRB/IACUC#: 2013.14-18-A05

1810 - Poster **Classification:** GSBS Student

Presenter: Charity Smith **Department:** Institute for Healthy Aging

Authors: Charity Smith B.S., UNT Health Science Center; Jo Contreras B.S., UNT Health Science Center; Daniel Metzger, UNT Health Science Center; Anthony Oppong-Gyebi, UNT Health Science Center; Ella A. Kasanga, UNT Health Science Center; Philip Vann, UNT Health Science Center; Nathalie Sumien, UNT Health Science Center; Rebecca Cunningham, UNT Health Science Center; Derek Schreihofer, UNT Health Science Center

Influence of Testosterone Deprivation and Replacement on Cognition and Oxidative Stress in Middle-Aged Male Rats

Purpose: Data from aged men suggests a negative correlation between testosterone levels and cognitive function, including the development of mild cognitive impairment and Alzheimer's disease. The purpose of this study was to 1) determine whether long-term testosterone deprivation (LTTD) impairs cognition and increases oxidative stress in the middle-aged male rat brain and 2) determine whether testosterone (T) replacement after LTTD can reverse these effects.

Methods: Twelve-month old male Fischer 344 rats (13 per group) were left intact or castrated for 2 weeks and replaced with subcutaneous implants containing T (short-term T deprivation; STTD). Additional groups were castrated for 10 weeks before being treated with T (long-term T deprivation; LTTD+T) or cholesterol (LTTD). Rats underwent cognitive testing with the Morris water maze (MWM). A 4-day acquisition phase was used for rats to learn the location of a hidden platform. A retention day was used to determine whether rats remembered the platform location after it was removed. A 2-day reversal trial in which the platform was moved to a new location was used to examine mental flexibility. These tests require both hippocampal and cortical areas of the brain. Following MWM rats were euthanized and brains were collected for immunoblotting for markers of cell death (Spectrin) and oxidative stress responses (NFkB, COX2, NOX2) in the hippocampus and cerebral cortex. Plasma advanced oxidative protein products (AOPP) were used as a peripheral marker of oxidative stress. Total testosterone was measured by ELISA.

Results: Castration reduced total testosterone to 40% of intact levels whereas testosterone implants increased levels back to those of intact males. Overall, intact rats performed significantly worse on the MWM than STTD and LTTD with or without T replacement. We saw no significant changes in blood AOPP among treatment groups. Similarly, there were no significant differences in the expression of oxidative stress regulated genes or Spectrin cleavage in the hippocampus. Cortical measurements are on-going.

Conclusions: These data suggest that castration with or without T replacement improves cognitive function in middle-aged rats, but does not significantly alter oxidative stress in the brain or periphery. These data support the safety profile of testosterone replacement to physiological levels and do not recapitulate correlative data observed in men.

Sponsor: NIH/National Institutes on Aging
IRB/IACUC#: 2013.14-18-A05

1811 - Poster **Classification:** Postdoctoral Fellow

Presenter: Fen Sun **Department:** Institute for Healthy Aging

Authors: Fen Sun, UNT Health Science Center; Daniel Metzger, UNT Health Science Center; Anthony Oppong-Gyebi, UNT Health Science Center; Philip Vann, UNT Health Science Center; Nathalie Sumien, UNT Health Science Center; Robert Luedtke, UNT Health Science Center; Derek Schreihofer, UNT Health Science Center

Graded Mild Head Injury as a Model for Sports Injury

Purpose: To develop a graded model of mild head injury that produces graded behavioral deficits in the mouse. This model will be used to test neuroprotective effects of novel compounds. This study was designed to determine the severity of injury required to cause different behavioral deficits in motor function and cognition.

Methods: Young adult male C56/B6J mice were anesthetized daily with isoflurane (20 sec) and 15 sec later were subjected to a weight drop head injury using a tethered steel bar (43 grams) dropped through an acrylic tube from a height of 28 inches. Mice were placed prone on a scored aluminum foil stage 2 cm below the end of the tube. The blow was directed to a 5 mm midline area of the head rostral to the aural canals. The blow causes a break in the scored aluminum foil and allows the mouse to flip 180 degrees and land supine on a foam cushion. This model was chosen to model a hit to the head followed by rotational acceleration indicative of closed head injuries occurring in contact sports. Five groups of mice were randomized to receive 0, 5, 10, 15, 20, or 25 blows, 1 per day M-F. Five days after the final hit, mice then underwent cognitive and behavioral testing consisting of an accelerating Rotorod, Morris water maze, and active avoidance T-maze. Following testing brains will be examined for cell death and inflammation.

Results: A total of 30 mice (5 per group) were used for this study. Body weight did not differ among the groups over the course of the study, however waking time after anesthesia was increased in all groups subjected to injury compared to mice anesthetized and not injured. Coordinated movement on an accelerating Rotorod revealed a linear trend for decreased performance with increasing number of head impacts suggesting that a graded approach is possible with this model. Time to fall was significantly shorter than controls at 15 and 25 hits. Water maze and T-maze tests are ongoing.

Conclusions: These data suggest that a graded injury regimen can lead to graded behavioral responses in the young male mouse and will provide a useful model for testing the effectiveness of neuroprotective compounds that have the potential to be used as prophylactic agents for those involved in contact sports.

Sponsor: Institute for Healthy Aging
IRB/IACUC#: 2014.15-42-A04

1812 - Poster **Classification:** GSBS Student

Presenter: Mavis A. Tenkorang **Department:** Pharmacology & Neuroscience
Authors: Mavis Tenkorang, UNT Health Science Center; Rebecca Cunningham, UNT Health Science Center

NADPH Oxidase (NOX1) Mediates Testosterone-Induced Neurodegeneration

Purpose: One of the primary characteristics of Parkinson's disease (PD) is oxidative stress (OS). Men have a higher risk for PD than women. Testosterone, a primary male sex hormone has been implicated in PD, and is a known oxidative stressor. Previous studies in our lab have shown that testosterone exacerbates OS damage in dopaminergic neurons. However, the mechanism by which testosterone increases OS is unknown. We hypothesize that in dopaminergic cells, testosterone increases OS by activating NOX 1, a major OS generator in cells.

Methods: To test our hypothesis, we used a dopaminergic cell line (N27 cells). For an oxidative stressor, we used tert-butyl-hydrogen peroxide (H_2O_2) to induce 20% cell loss prior to testosterone (100nm) administration. NOX1 inhibitors (Apocynin, Diphenyleneiodonium-DPI) were administered before H_2O_2 exposure. Cell viability was quantified using the MTT assay.

Results: Testosterone is only damaging in the presence of OS. DPI, alone, was damaging to N27 cells, hence this was no longer used as a NOX1 inhbitor. Unlike DPI, Apocynin had no effect on cell viability. Further, Apocynin did not alter H_2O_2-induced cell loss, indicating that H_2O_2 increases OS via a non-NOX1 mechanism. However, Apocynin blocked testosterone's damaging effects in an oxidative stress environment.

Conclusions: Testosterone-induced cell loss is mediated by NOX1, indicating that NOX1 is involved in testosterone induced OS generation. By understanding testosterone's mechanism of action, potential therapeutic targets for Parkinson's disease can be explored.

Sponsor: N/A
IRB/IACUC#: N/A

1813 - Poster **Classification:** GSBS Student

Presenter: Jessica Toofan **Department:** Institute for Healthy Aging
Authors: Jessica Toofan, UNT Health Science Center; Nataliya Rybalchenko, UNT Health Science Center; Meharvan Singh, UNT Health Science Center

The Influence of Estrogen on a Potential Memory Gene, RbAp48

Purpose: With aging, there is a tendency for humans to experience cognitive decline. Known variations in cognitive function with age provide an opportunity to investigate the reasons why some individuals age successfully while others do not. In some women, the postmenopausal period is associated with a decline in cognitive function. While hormone (replacement) therapy may have merit, its current use for treating cognitive dysfunction is controversial. At best, we recognize that there are responders and non-responders. Given that the histone binding protein, RbAp48, was recently implicated as a key determinant of cognitive dysfunction with age, we sought to determine the role of RbAp48 as a mediator of estrogen's influence on cognitive function. As an initial investigation into the role of RbAp48 in mediating estrogen's effect on cognitive function, we sought to determine if, in animal models of aging currently being used in our laboratory, RbAp48 declines with age, and if estrogen treatment influences RbAp48 expression.

Methods: We evaluated the expression of RbAp48 in the hippocampus of female Sprague Dawley rats that were 4 months and 10 months of age, representing young adult and middle-aged rats. Within these two groups, we had two treatment groups: ovariectomized (OVX) and ovariectomized + estradiol treatment (OVX + E_2). RbAp48 mRNA was assessed using semi-quantitative real-time PCR (rtPCR). GAPDH was used as a loading control, as it is stably expressed at high levels. Differences in expression of RbAp48 were based on the delta-delta CT methodology published by Livak and Schmittgen (2001). Statistical evaluation of differences between experimental groups was determined using a two-tailed t-test.

Results: Our data revealed a statistically significant (n=5, p=0.0079) reduction in the levels of hippocampal RbAp48 mRNA in the 10 month mice, compared to the 4 month mice. Interestingly, E_2 reduced RbAp48 in young OVX rats (n=5, p=0.0079), but had no effect on RbAp48 mRNA levels in middle-aged ovariectomized (n=5, p=0.1508).

Conclusions: These studies confirm the reduction of RbAp48, a presumptive "memory gene", with with age, but failed to implicate RbAp48 as a mediator of E_2's effects. Instead, we suggest that RbAp48 is permissive for E_2's effects. Ongoing studies will determine whether knockdown of RbAp48 expression abrogates estrogen's positive effects on those measures relevant to cognitive function.

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1814 - Poster **Classification:** Postdoctoral Fellow

Presenter: Kiran Chaudhari **Department:** Institute for Healthy Aging

Authors: Kiran Chaudhari, UNT Health Science Center; Ali Winters, UNT Health Science Center; Ritu Shetty, UNT Health Science Center; Wenjun Li, UNT Health Science Center; Luokun Xie, UNT Health Science Center; Jude Prah, UNT Health Science Center; Ran Liu, UNT Health Science Center; Nathalie Sumien, UNT Health Science Center; Shaohua Yang MD, PhD, UNT Health Science Center

Sex Dependent Alteration in Psychomotor and Cognitive Functions After Chronic Metformin Treatment

Purpose: Metformin, the most commonly used anti-hyperglycemic medication has been proposed to have delayed aging and longevity benefits. Without due consideration to gender/sex influence, metformin administration is being tested for non-diabetic benefits. Amid mixed reports on cognition, the purpose of the current study was to identify the influence of sex variation in the psychomotor and cognitive outcomes after long term metformin treatment.

Materials and Methods: Young normo-glycemic male and female C57BL/6J mice (aged 4 mo, n=10 each; total n=40 mice) were randomly assigned to either a control group or metformin group (administered 2 mg/ml in drinking water). After 1 month of treatment, a battery of behavioral tests was initiated to assess the psychomotor and cognitive functions. Metformin treatment was continued during behavior assessment.

Results: Overall female mice weighed lesser than male mice. Over the experiment time span, metformin neither altered the body weight nor decreased the blood glucose level significantly. There was no variation in muscle strength or reflexes between male and female mice on either treatment. Male mice were more anxious than female mice and metformin treatment decreased anxiety in male mice only. Female mice had better motor learning and maximum coordinated running performance than male mice. Metformin treatment improved motor learning only in male mice. Metformin treatment improved balance function irrespective of sex. Overall male mice had better retention of long term memory which was deteriorated after metformin treatment. Further, metformin impaired the short term memory and cognitive flexibility only in male mice.

Conclusions: This study demonstrated that metformin affects psychomotor or cognitive function differently influenced by sex. Our results suggested that chronic metformin was beneficial for psychomotor function and detrimental for short term and long-term memory in male sex. While, in female sex, metformin had beneficial or no effects on brain functions.

Sponsor: AHA
IRB/IACUC#: N/A IACUC-2016-0025

1815 - Poster **Classification:** GSBS Student

Presenter: Nicholas Kubelka **Department:** Institute for Healthy Aging

Authors: Nicholas Kubelka, UNTHSC; Nataliya Rybalchenko, UNT Health Science Center; Meharvan Singh PhD, UNT Health Science Center

Connexin 43 as a Mediator of Estrogen-induced Protection against Oxidative Stress

Hypothesis: 17-β estradiol (E2) and the estrogenic metabolite of dihydrotestosterone (DHT), 5-α-androstane-3,17-β-diol (3βdiol), protect against oxidative stress by increasing the expression and function of Connexin 43 (Cx43) – containing gap junctions in cortical astrocytes.

Methods: In order to assess the expression of Cx43 and cell viability, real time RTPCR and the MTT assay was used, respectively. Cerebral cortical astrocytes derived from postnatal day 2 female C57/Bl6 mice were treated with physiologically relevant concentrations of E2, DHT, 3βdiol, or the vehicle control, DMSO, and evaluated for Cx43 mRNA expression. For the cell viability assays, astrocytes were pre-treated with either E2, DHT or DMSO vehicle control and then exposed to iodoacetic acid (IAA) oxidative insult. To further determine the role of Cx43 gap junctions, either Gap19 (inhibitor of the Cx43 hemichannel) or Gap26 (inhibitor of the dimeric Cx43 containing gap junction) were co-applied with the insult.

Results: E2 treatment (3 hr) significantly increased Cx43 mRNA expression relative to DMSO control, while both DHT and 3βdiol (also applied for 3 hr) did not. Longer treatment with E2 (18 hr) yielded a non-significant trend to increase Cx43 mRNA expression. In the viability assays, neither E2 or DHT alone (18 hours pre-treatment) nor the Cx43 hemichannel selective inhibitor peptide (Gap19) alone protected against IAA toxicity. However, Gap19 did increase the protective efficacy of not only E2, but DHT as well. Interestingly, inhibition of both Cx43 hemichannels and the dimeric Cx43-containing gap junctions using Gap26, in and of itself, conferred protection against IAA toxicity. Like Gap19, Gap26 also significantly enhanced the protective efficacy of E2.

Conclusions: Both E2 and DHT showed some regulatory interaction with astrocyte Cx43 that impacted protection against oxidative stress. This is the first evidence that E2 or DHT regulate Cx43 in the brain and the mechanisms underlying these interactions remain to be further characterized.

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IRB/IACUC#: 2014/15-37-A04

Other (Abstracts in the 1900s)

1900 - Poster **Classification:** Pharmacy Student
Presenter: Brighton Abebe **Department:** Pharmacy
Authors: Brighton Abebe, UNT Health Science Center; James Huang, UNT Health Science Center; Patrick Clay, UNT Health Science Center

Comprehensive Literature Examination to Derive Terminology Currently Used to Describe Pharmacist Provided Services and to Develop a Checklist for Research and Journal Editors

Background: Reporting of pharmacist interventions in research publications requires a detailed description of the intervention and language used to evaluate them. However, reviews and meta-analyses of publications of pharmacist interventions often reveal insufficient and incomplete information. Further practitioners and policy makers who rely on pharmacists publications to inform decision making, identified lack of cohesiveness in the manner in which pharmacist interventions are described in publications. Incomplete reporting of interventions hinders the optimal use of research, and fails to meet broader applications. Pharmacist researchers are aware of CONSORT but the median overall compliance is low and the checklists is not fully appropriate for pharmacist interventions. The purpose of this research was to develop a checklist, with key emphasis in intervention and standardized lexicon to potentially enhance the quality of pharmacy research.

Methods: This is a 4-step study. First stage was to extract the actual services provided by pharmacists from the methodology section of publications and compile a services provided category. The search for publications focused on PubMed database and evaluated using the PRISMA checklist. Second stage was to assess existing checklists used by researchers and design a draft checklist. The remaining two stages will externally validate the checklist by collecting qualitative feedback from experts in research, policy, and practice. Stage three is to validate the content of the draft checklist to a collection of relevant manuscripts with the help of independent reviews. State four is to conduct large-scale iterative testing to demonstrate relevance to a wider range of stakeholders.

Results: From a database search of nearly 4,581 publications 30 RCT publications were eligible for extracting actual services provided by pharmacists. The SNOMED CT was also used to extract services. The terminologies were then added to the checklist. The checklist included 7 main questions (constructs) titled Intervention, Provider, Delivery Mode, Demographic, Schedule, Setting, and Authorization. Stage three and four are proceeding this summer.

Conclusions: A draft pharmacist intervention lexicon and checklist has been developed for use by pharmacist. A unique advantage of this proposed checklist is the incorporation of an evidence based lexicon within the checklist providing the pharmacy service nomenclature to use in publications.

Sponsor: N/A
IRB/IACUC#: N/A

1901 - Poster **Classification:** Pharmacy Student
Presenter: Estela M. Alba **Department:** Pharmacy
Authors: Estela M. Alba, UNT Health Science Center; Annesha White, UNT Health Science Center

Utilizing an Inter-Professional Approach to Enhance Patient Safety: Identifying Inefficiencies in PBM Prescription Processing

Background: Pharmacy Benefit Managers (PBMs) offer health plans a variety of services including negotiating price discounts with retail pharmacies, negotiating rebates with manufacturers, and operating mail-order prescription services and administrative claims processing systems among other services. The impact of PBMs on patient health is significant; therefore, it is important to understand the current challenges this industry.

Objective: The objective of this study was to review the literature within the last seventeen years regarding inefficiencies in PBM prescription processing. A secondary objective was to discuss solutions to decrease error assisting patient in the mail order process.

Methods: Journal articles were compiled through use of PubMed, Scopus, and Google Scholar using specific key terms. Articles selected for review were published from January 1, 1999 through May 1, 2016. This timeframe was selected based on the technological advances in the early 2000's. The articles required information on current challenges and inefficiencies in prescription processing; particularly, articles pertaining to time efficiency, limitations, and future needs. Articles pertaining to pharmacy dispensing accuracy were also utilized as a secondary search and mainly focused on U.S. data.

Results: Twenty articles were found, seven pertaining to the inefficiency in the insurance claim process and formularies, seven pertaining to prescriber outreach, and five pertaining to prescription data entry. Possible solutions explored for insurance claim processing were the access of prescribers to up-to-date and reliable formularies. Solutions discussed for prescriber outreach, were the further implementation of eprescription with more efficient features such real time tracking and messaging between prescriber and pharmacy. Additionally, for prescription data entry, synchronizing the eprescribing system so the prescriber can directly enter a prescription into the pharmacy's system without the need of a technician having to repeat this step.

Conclusions: Future trends reveal that e-prescribing will provide favorable outcomes to patients by decreasing inefficiencies in the prescription fulfillment process as well as decreasing cost. Patient safety will remain at the forefront as New York and Maine have already passed legislation mandating the adoption of eprescriptions. Healthcare team management of patients' therapy and delivery are growing. It is imperative to address current and future challenges with the purpose to improve patient outcomes and satisfaction.

Sponsor: N/A
IRB/IACUC#: N/A

1902 - Poster **Classification:** Faculty (Not for Competition)
Presenter: John Allen **Department:** Geriatrics
Authors: John Allen, UNT Health Science Center; Patricia Connally, UNT Health Science Center

A STEP in the Right Direction: An Interdisciplinary Approach to Transitional Care

Background: The Affordable Care Act, calls for more focus on finding innovative delivery systems that improve care, increase efficiency, and reduce costs.

Purpose: Hospital readmissions, excessive falls, and poor quality of life are factors that unnecessarily increase healthcare costs. The Safe Transitions for the Elderly Patients (STEP) program is a hybrid transitional care model developed by the UNT Health Science Center (UNTHSC) as part of an 1115 Waiver to address these factors in a home care setting in Tarrant County.

Objectives: The primary goals of STEP are to reduce all-cause 30 day hospital readmissions, improve quality of life, and decrease falls among Medicaid patients over 50 years through a collaborative and interdisciplinary approach to patient care.

Methods: An interprofessional team that includes a physician/geriatrician, nurse practitioner, physician assistant, social workers, physical therapists and a dietician assess and treats the patient in the home for up to 90 days post hospital discharge based on the individual patient needs.

Conclusions: Through this model, UNT Health Science Center has the opportunity to demonstrate a unique transitional care model that will improve health care delivery post-hospitalization.

Sponsor: N/A
IRB/IACUC#: N/A

1903 - Poster **Classification:** TCOM DO Student
Presenter: Sarah Alpini **Department:** Texas College of Osteopathic Medicine
Authors: Sarah Alpini, UNT Health Science Center; Jenny Lee, UNT Health Science Center

Efficacious Integration of Health and Wellness Coaching into Clinical Care for Weight Management: A Review and Proposal

Objective: We examined health and wellness coaching in a clinical setting to motivate patients to pursue healthy lifestyles towards effective and sustainable weight management, and proposed an efficacious approach to integrate coaching into clinical care weight management.

Methods: We conducted a systematic review of literature for the past 10 years concerning coaching for weight loss in a primary care setting, which yielding 75 studies. Abstracts were reviewed and excluded if they concerned non-coaching interventions or coaching in the context of non-obesity. After exclusion and inclusion criteria, 11 coaching studies were considered for evaluation. Studies were considered efficacious if the coaching intervention resulted in clinically meaningful weight loss (> 5% initial body weight in six months) or statistically significant weight loss compared to standard care. Selected studies were analyzed according to the approach coaching was applied towards weight management including: who administered coaching, how patients coaching, dosage of coaching intervention, and the results of treatment.

Results: Coaching resulted in clinically meaningful weight loss in nine studies and statistically significant weight loss in four. Coaching offered at least at a moderate dose (>1/month) with a trained coach was most efficacious in achieving clinically meaningful weight loss. Coaching interventions for longer time frames was more likely to foster sustained weight loss. Coaching was successful in a variety of settings and with electronic support. Coaching also significantly improved diabetes and cardiovascular risk factors, healthy behaviors, and self-sufficiency for maintaining these changes.

Conclusions: The present study may contribute to the growing evidence of coaching as an efficacious and sustainable lifestyle intervention strategy for clinical weight management. It is recommendable for primary care practitioners to integrate health and wellness coaching into their clinical encounters to promote behavioral changes in patients who are overweight or obese. We propose that coaching is most successful when integrated for a prolonged time frame, minimally at a moderate to high intensity frequency, via various modes of delivery, and with a coach who has completed coaching training. Coaching was also successful when personalized to suit patient needs, which will help providers optimize patient care and enable patients become advocates for their own health.

Sponsor: N/A
IRB/IACUC#: N/A

1904 - Poster **Classification:** Resident

Presenter: Laura Baker **Department:** Family Medicine

Authors: Laura Baker DO, MS, UNT Health Science Center; Susan Franks DO, MS, UNT Health Science Center; Shane Fernando PhD, MS, UNT Health Science Center; Nusrath Habiba DO, FAAP, UNT Health Science Center; Kimberly Fulda DrPH, UNT Health Science Center

Are Sugar-Sweetened Beverages Associated with Markers Of Metabolic Syndrome in Children?

Background: Childhood obesity has been recognized as having multiple determinants. Recent research has attempted to better delineate the role that specific food and beverage choices may have in the development of an obese state and its comorbidities. Sugar sweetened beverages (SSB) have been linked as possible causative agents in excess weight and higher risk of metabolic syndrome, type 2 diabetes (T2DM), cardiovascular disease, and increased inflammation in adults and young children; however, research to date is equivocal and not without controversy. The purpose of this study was to identify associations of SSB with early markers of metabolic syndrome (MetS) in children.

Hypothesis: We hypothesized that increased consumption of SSB correlates with elevated glucose, high density lipoprotein (HDL), low density lipoprotein (LDL), and triglycerides (TG).

Methods: African American and Hispanic children aged 10-14 and parent/legal guardians were enrolled from the North Central Texas area in a study examining risk for T2DM. A self-report survey was completed with parental assistance that included questions regarding diet and Tanner staging. Blood samples were obtained to analyze glucose, HDL, LDL, and TG. Elevated glucose was defined as fasting 100-125 mg/dL or post-prandial 140-199 mg/dL. Linear and logistic regressions were used to determine associations between SSB and glucose, HDL, LDL, and TG while controlling for age, gender, race and Tanner staging.

Results: Participants (N=272) were 50.4% female. The mean age was 11.88 + 2.57 years. SSB consumption ranged from 0 to 4 servings per day, and was associated with significantly increased risk of elevated glucose (OR = 1.79, 95% CI 1.10-2.92). Associations for HDL, LDL, and TG were not significant.

Conclusions: Excess daily consumption of SSB among youth appears to be related to increasing risk of high glucose levels and may be a red flag to physicians to counsel parents on its potential relationship with T2DM. Results of this study add support to the literature regarding adverse health effects of excess consumption of SSB.

Sponsor: UNTHSC Intramural grant
IRB/IACUC#: 2011-136, 2012-151

1905 - Poster **Classification:** Faculty (Not for Competition)
Presenter: Katura C. Bullock **Department:** Pharmacy
Authors: Katura Bullock, UNT Health Science Center; Caitlin Gibson, UNT Health Science Center; Annesha White, UNT Health Science Center

Assessment of a Faculty Mentoring Program Implemented at the UNT System College of Pharmacy

Objectives: As new pharmacy schools continue to be established, design and structure of faculty mentoring programs continues to receive increased attention. Effective mentoring can lead to increased faculty productivity and retention, and enhanced career satisfaction and achievement. Few studies have evaluated pharmacy faculty mentoring programs. The objective of this study was to (1) describe the nature and extent of mentoring relationships established at a new college of pharmacy and (2) compare those relationships based on whether the mentor involved was an on-site or off-site mentor.

Methods: In 2016, a Qualtrics™ survey was developed by members of the College Faculty Mentoring Study Group and the Assessment Committee and sent to faculty members with(1=strongly disagree, 5=strongly agree) and open ended questions. Descriptive statistics were used to summarize responses to both surveys. This study was approved by the IRB.

Results: Of the 13 survey responses, the majority of mentees were female (69%), non tenure track (54%) and had one (38%) or two (54%) mentors. The preferred mentoring type was unstructured but in person (69%) and optimal duration for more than 1 year (54%). Time commitment to partnership was 1-2 hours per month (85%). General attitude towards mentoring was positive (85%). Respondents agreed or strongly agreed that their mentoring partnership increased their confidence in teaching (38%), research (69%) and service (69%). Mean scores were: My mentor was readily available (4.23), My mentor was a good match for me (4.00), I benefited from my mentoring partnership in terms of my personal growth (4.00), I am better prepared to advance my career (4.00) and overall satisfaction with the mentoring process (4.08). A comparison of on-site (77%) vs. off-site (23%) mentors showed a significant difference in responses to the items 'I benefited from my mentoring partnership in terms of my personal growth' (on-site mean 4.00 vs. off-site mean 5.00) and 'My mentoring partnership has increased my work productivity' (on-site mean 3.44 vs. off-site mean 5.00) ($p<.05$).

Conclusions: Findings from the faculty mentoring program may assist other health disciplines in planning similar programs. Future research includes aims to compare views on mentoring by clinical vs. non clinical faculty.

Sponsor: N/A
IRB/IACUC#: 2016-148

1906 - Poster **Classification:** TCOM DO Student

Presenter: Brittany Calder **Department:** Pediatrics

Authors: Brittany Calder, UNT Health Science Center; Amy Raines-Milenkov DrPH, UNT Health Science Center; Paul Bowman MD, UNT Health Science Center; Deep Shah MD, MPH, CPH, UNT Health Science Center

Benefits of a Pediatric Home Visitation Program Involving TCOM Students

Background: Home visitation programs increase child development, access to healthcare, and attendance at well child visits as well as decrease accidental injuries. By focusing on maternal and child health, there is the opportunity to prevent disease development, improve overall health, and decrease infant mortality. Including medical students in home visitation has the potential to build relationships and understanding that increases quality of care and learning. The purpose of this project was to assess the feasibility and benefits of incorporating Texas College of Osteopathic Medical (TCOM) students into an existing UNT Health Science Center home visitation program.

Methods: To assess the feasibility of this type of model at UNTHSC, a literature review of home visitation programs that involve medical students was conducted. Additionally, an interview and review of similar UNTHSC programs were conducted.

Results: The literature revealed several benefits for student learning. For example, medical students found that many of their misconceptions about their patients and their care were corrected by visiting the patient's home. Additionally, students felt they could provide better care after seeing the environments where their patients lived. The experience also helped the students view the patient as a person not just their disease and increased humanism in their care.

Conclusions: The literature suggests incorporating medical students into home visitation programs has benefits for the medical students and their future practice. UNTHSC has existing assets that could foster this type of educational experience. For example, the Healthy Start Program is a home visitation program with the intention of improving maternal and infant health. This program would be the backbone for a program involving medical students. Additionally, TCOM has a geriatric home visitation program whose logistics and curriculum could be used as a layout for a similar pediatric based program. A logic model detailing a sample pilot project will be presented.

By building from established programs, instituting a pediatric home visitation program involving TCOM students could improve the quality of the medical students' education while embracing the osteopathic model and providing service to the community. However, more research is needed to understand the program participant's perspectives and acceptability of receiving services from medical students.

Sponsor: N/A
IRB/IACUC#: N/A

1907 - Poster **Classification:** GSBS Student

Presenter: Carmen Claudio **Department:** Graduate School of Biomedical Sciences
Authors: Carmen Claudio, UNT Health Science Center; Ren-Qi Huang, UNT Health Science Center; Glenn Dillon, UNT Health Science Center

Modulation of GABAA Receptor Function by Ascorbic Acid

Purpose: Ascorbic acid, commonly known as vitamin C, is a vital antioxidant in the brain and is present in millimolar concentrations in neuron-rich areas. Ascorbic acid has numerous functions including modulation of neurotransmission and maintaining redox balance. It has been shown to protect neurons from excitotoxicity induced by activation of the NMDA receptors. While neuronal excitability reflects a balance between excitation and inhibition, GABA is the main inhibitory neurotransmitter that binds to $GABA_A$ receptors and reduces neuronal excitability. The purpose of the present study is to determine whether ascorbic acid influences $GABA_A$ receptor function.

Methods: Whole-cell currents were recorded with patch clamp technique from human embryonic kidney cell line (HEK 293) stably expressing recombinant human $a_1b_2g_2$ $GABA_A$ receptor which is the most abundant form of $GABA_A$ receptors in the brain.

Results: Ascorbic acid alone did not induce any current. However, when co-applied with 3 mM GABA, ascorbic acid concentration-dependently increased GABA response with an EC_{50} value of 201 mM and an efficacy of 231%. Ascorbic acid induced similar potentiation of the currents activated by muscimol, a $GABA_A$ receptor agonist. Pre-treatment with 100 mM ascorbic acid for 10 sec caused a persistent enhancement in GABA response. The potentiating effect on GABA-activated currents was also induced by D-isoascorbic acid, a steroisomer of ascorbic acid with similar antioxidant property.

Conclusions: Ascorbic acid modulates $GABA_A$ receptor function and this effect is partially mediated by a redox-dependent mechanism. Furthermore, the enhancement of GABAergic inhibition by ascorbic acid can potentially contribute to neuroprotection against excitotoxicity.

Sponsor: N/A
IRB/IACUC#: N/A

1908 - Poster **Classification:** Faculty (Not for Competition)
Presenter: Jennifer Fix **Department:** UNT Health Family Medicine
Authors: Jennifer Fix, UNT Health Science Center; Caleb Daugherty, UNT Health Science Center

Inter-Professional Team Communication to Improve Patient Safety: A Medication Safety Tip Sheet

Objective: Communication in healthcare teams is essential to decrease medical errors and improve patient health outcomes. With these themes in mind, the objectives of this study were to: (1) Enhance patient safety (2) Demonstrate effective collaboration by members of the healthcare team (3) Address polypharmacy through patient education and (4) Develop a patient education tool that is endorsed by the Institute for Patient Safety and UNT Health.

Methods: This descriptive study examined the process of establishing a group and tool to enhance patient safety. A work group was convened with the following members: Nurse Practitioner, Susan Matthew, a care provider for Mighty Care clinics, Associate Professor of Pharmacotherapy and Family Medicine, Dr. Jennifer Fix, clinical pharmacist provider of services for the Division of Family Medicine's Mighty Care Medical Clinics. and fourth year student pharmacist Caleb Daugherty on his advanced pharmacy practice experiential (APPE) rotation tasked by NP Matthew to develop a tip sheet to hand out to patients to help them with understanding the dangers of mixing medications. Mr. Daugherty submitted his assignment prior to completing his rotation. Dr. Fix forwarded the first draft submitted by Mr. Daugherty to all providers within the Mighty Care Team who had an opportunity to provide input and edits to the document thereby developing a second draft of the document. Provider designations of contributors to the project included medical doctor, osteopathic doctor, nurse practitioner, physician assistant, medical assistant, social worker, pharmacist, and student pharmacist.

Results: Because of the importance of communicating printed materials to consumers at an appropriate reading level, the Medication Safety Tip Sheet was presented to the Institute for Patient Safety for their review and assistance in revising the handout. The Medication Safety Tip Sheet is ready for patient distribution. Sharing of the Tip Sheet with patients has begun and patient as well as provider feedback is noted. Based on the positive feedback received on the use of the tool, a pre and post assessment survey is planned to track the usefulness of the tool. The survey will be administered prior to handing the patient the education tool and at a future visit not later than 180 days. Various providers also encourage adoption of the patient education tool by all UNT Health Prescribers.

Conclusions: It is anticipated that the conclusions derived from the survey data will show that patients benefited from the educational tool and that it proves to be useful for enhancing patient safety while meeting the stated objectives for the project.

Sponsor: 1115 Waiver (Mighty Care Project)
IRB/IACUC#: N/A

1909 - Poster **Classification:** TCOM DO Student
Presenter: Gabriel Gonzales **Department:** Orthopaedic Surgery
Authors: Gabriel Gonzales, UNT Health Science Center; Brian Webb, UNT Health Science Center

Rotational Alignment in the Coronal Plane During Tibial Tubercle Osteotomy Background & Significance

Significance & Hypothesis: Prior literature has demonstrated the effects of translation of the tibial tubercle during tibial tubercle osteotomy (TTO) procedures in both the sagittal and transverse planes but there has not been much investigation into the effects of adjustment of the rotation alignment of the tibial tubercle in the coronal plane. Since changes in the positioning of the tibial tubercle in all three planes has the opportunity to yield significant physiological changes in range of motion, the results of this study would possibly provide insight on how to optimize this procedure. Specifically, a margin of error determination may be made from the data to guide surgeon fixation of the tubercle post osteotomy. This study is aimed at the effects of variations to the tibial tubercle in the TTO procedure, specifically investigating effects of rotational alignment of the tibial tubercle in the coronal plane. The hypothesis of this study is that coronal plane rotation during TTO must be within 5 degrees of native orientation to prevent poor patellofemoral kinematic effects.

Materials & Methods: At least 10 frozen, fresh, prepared specimens would have the musculature of the thigh exposed with specific muscles sutured to accommodate loads of weight specific to each muscle type to achieve standardized range of motion. The specimens would be secured into a knee-rig structure allowing full flexion and extension. Each specimen would be initially range of motion tested and used as control for comparison to the resulting range of motion after the TTO is performed. A tracking system will be utilized, recording patellar range of motion data with 6 degrees of freedom during leg range of motion testing cycles. For each specimen, initial native patellar motion would be documented, and then compared against resultant patellar motion as the degree of tibial tubercle rotational alignment in the coronal plane is incrementally adjusted. Comparison will involve evaluation of the Euler angle changes of the native patella against measurements as the rotational alignment is adjusted. A repeated one-way ANOVA will be used with a post hoc tukey test to find statistical significance.

Results: Pathologic rotational motion of the tibia on femur has been noted grossly with alterations of coronal alignment of the tibial tubercle, especially at the end range of extension. Detailed statistical analysis is currently pending on gathered data.

Conclusions: Rotational alignment modification of the patellar tendon insertion, the tibial tubercle, causes unilateral unloading and loading of the quadriceps musculature. This change in force vectors results in gross change to lower extremity flexion and extension mechanics. Further data analysis is required to make specific comments on the details of this change.

Sponsor: N/A
IRB/IACUC#: N/A

1910 - Poster **Classification:** Faculty (Not for Competition)
Presenter: Eric B. Gonzales **Department:** Institute for Healthy Aging
Authors: Eric Gonzales, UNT Health Science Center

UNTHSC Ion Channel Screening and Drug Discovery

Background: The cost to develop a new drug is in the billions of dollars. In the drug development timeline, there are numerous hurdles that must be addressed. These range from generating novel ligands to target a receptor (e.g. ion channels) to toxicology studies. Furthermore, cardiotoxicity studies are needed before any compound can be studied clinically. Many companies and research laboratories start with compound libraries, containing hundreds to thousands of potential drugs. Screening these libraries for ion channel activity may necessitate partnering with laboratories focused on these screens.

Discussion: In 2017, UNT Health Science Center will obtain a computer assisted patch-clamp electrophysiology system that will aid in the screening of ligands and candidate drug libraries for ion channel activity and cardiotoxicity screening. This system will be available for use by UNTHSC laboratories and industry collaborators. This presentation will outline the system's capabilities, potential screens for pharmacological targets, and develop collaborations to develop tomorrow's therapies.

Sponsor: UNTHSC Joint Seed Program For New Instrumentation/Critical Resources
IRB/IACUC#: N/A

1911 - Poster **Classification:** Resident (Not for Competition)
Presenter: Nguyen Nguyen **Department:** Obstetrics and Gynecology
Authors: Christine Hoang MD, UNT Health Science Center; Nguyen Nguyen MD, JPS Health Network; Martha Felini PhD, MPH, UNT Health Science Center

Interest and Attitudes Toward Global Health Training of Prospective Obstetrics and Gynecology Residents

Purpose: The benefits of global health training in residency clinical education have been well described in graduate medical education literature. Despite these benefits there is a lack of elective global health training opportunities offered by OBGYN residency programs nationally. The purpose of the study is to assess prospective OBGYN residents' interests and attitudes toward global health training during their residency. Results of the survey can potentially help develop a global health educational curriculum and clinical training opportunity for the JPS OBGYN residency program.

Methods: A survey was developed to assess the prospective residents' views on global health training. Questions assessing interest and attitudes utilized a Likert scale response. Demographic information was collected and applicants self-reported whether they had prior global health experience. The survey was anonymous and voluntary and distributed to all JPS OBGYN residency applicants who interviewed during the 2016-2017 season. The responses were analyzed and summarized.

Results: 50 applicants submitted survey responses. Of those applicants, 76% were likely or very likely to participate in a global health elective if offered by their residency program. 94% of applicants agreed that OBGYN residencies should offer voluntary electives in developing countries. 64% of applicants expressed an interest in incorporating global health involvement or international volunteer services into their future practice post-residency while 28% planned to focus their medical career on global health. Scheduling conflicts were perceived as the greatest barrier to participation. Learning about global public health systems and gaining procedural experience were the main interests expressed. Over half of the applicants had previously participated in a global health experience prior to applying for residency. There was a positive association between prior participation and future interest in incorporating global health into their post-residency practices.

Conclusions: Information obtained from the survey demonstrated that applicants to the JPS OBGYN residency program believe that a global health elective opportunity should be offered in residency training, and a majority would participate if given the opportunity. With the strong interest and positive attitudes toward a global health elective, steps can be taken to develop a curriculum and training opportunity for the residents.

Sponsor: N/A
IRB/IACUC#: JPS 110716.005e (FWA#00011753)

1912 - Poster **Classification:** School of Health Professions Student
Presenter: Harrison Howard **Department:** Physician Assistant Studies
Authors: Harrison Howard, UNT Health Science Center; Steven Houck, UNT Health Science Center; Ryan Baca, UNT Health Science Center; Josh Hockaday, UNT Health Science Center; Jessica Hartos, UNT Health Science Center

Is Weight Status Related to Asthma In Adult Males 35-54 Years Old?

Introduction: Asthma is a prevalent health issue today but the relationship between weight status and asthma in adult men has yet to be thoroughly explored. The purpose of this study was to assess the relationship between weight status and asthma in adult males 35-54 years old.

Methods: This cross sectional analysis used 2014 BRFSS data for males ages 35-54 from Hawaii, Massachusetts, Michigan, and Oregon. Multiple logistic regression analysis was used to assess the relationship between weight status and current asthma while controlling for ethnicity/race, exercise, tobacco use, education level, income level, and metropolitan status.

Results: Few males 35-54 years-old reported having current asthma (6-9%) and most reported being overweight (73-80%). After controlling for lifestyle and demographic factors asthma was not significantly related to weight status in any of the four states (Oregon, Hawaii, Michigan, Massachusetts).

Conclusions: Weight status was not related to asthma in general population samples of adult males 35-54 years old. A limitation of this study was, we collected info about current asthma not asthma symptoms or severity. The sample was population-based and, therefore, may be reflective of the primary care population. It is recommended that primary care practitioners not automatically screen overweight patients for asthma; however, this may be different in specialty settings.

Sponsor: N/A
IRB/IACUC#: 2016-074

1913 - Poster **Classification:** TCOM DO Student

Presenter: Zac Ingersoll **Department:** UNT Health Internal Medicine

Authors: Zachary Ingersoll, UNT Health Science Center; Stephen Weis, UNT Health Science Center

Recurrent Granuloma Gluteale Infantum Secondary to Encopresis

Background: Granuoma Gluteale Infantum is a rare pediatric dermatological disorder of unknown etiology. Suggested causes have included fluorinated corticosteroids, candida and topical corticosteroids. The case is unique due to its prolonged and recurrent nature, as well as it being secondary to encopresis. The patient is a 3-year-old male that has a history of perianal sores since shortly after birth. The sores persisted for the first three years of life causing significant pain and discomfort. This was most severe during defecation. Pain resulted in avoiding defecation and to encopresis. The patient was referred by their primary care clinician to a pediatric gastroenterologist and was diagnosed with encopresis after an abdominal X-ray. The relationship between the persistent perianal sores and stool pattern was not noted. The patient was referred to dermatology and was treated with barrier creams and laxatives.

Results/Conclusions: After initial resolution he returned several months later with a recurrence of the disease. The patient was in joint parental custody and alternated between two different homes. Care-givers were not in agreement with how to manage the patient's constipation. The sores returned coincident with soiling liquid from liquid stool. The patient was treated again with complete resolution. Our case with its relapsing and remitting course occurring coincident with fecal soiling supports of irritant contact dermatitis as etiology Granuoma Gluteale Infantum.

Sponsor: N/A
IRB/IACUC#: 2017-026

1914 - Poster **Classification:** TCOM DO Student

Presenter: Deepika Kaushal **Department:** Rural Medicine

Authors: Deepika Kaushal, UNT Health Science Center; Abdullah Mamun, UNT Health Science Center; Anthony Handoyo, UNT Health Science Center; John Pulvino, UNT Health Science Center; Stacy Abraham, UNT Health Science Center

An Evaluation of Attitudes and Understanding of Vaccinations in Rural Populations

Background: Recently in the media, there has been a movement to abstain from childhood immunizations. At the same time, a rise in the rate of preventable childhood diseases for which there are available immunizations has also been witnessed. It is known that the attitude towards vaccination of both the parents and providers and the knowledge about vaccines all influence vaccination compliance.

Methods: My colleagues and I surveyed rural communities in Texas to assess parental knowledge and how that affected vaccination compliance. Clifton, Texas is located in Bosque County. As of the census of 2000, there were 3,542 people. Plainview, Texas is located in Hale County. The current census data reports a population of 22,194. Bilingual versions of surveys developed by Zingg et al were distributed to participants with children up to 10 years of age who live in or near the rural towns of Clifton or Plainview between the fall of 2015 and the spring of 2016.

Results: When analyzing survey results, correct knowledge was estimated by summing over the number of correct answers for the 11 items in the survey. Using a multiple linear regression model our study revealed that here is statistically significant difference in knowledge on vaccination for parents who has a Bachelor degree or more in comparison to parents who are high school graduate or less after adjusting for the effects of race and number of children. However, there is no statistically significant difference in knowledge on vaccination for parents who has some college degree in comparison to parents who are high school graduate or less after adjusting for the effects of race and number of children.

Conclusions: On an average, parent's knowledge on vaccination increases as their number of children increases after adjusting for the effects of educational status and race. There is no statistical difference on vaccination knowledge in White versus Hispanic and White versus Other racial groups after adjusting for the effects of parent's education and number of children.

Sponsor: N/A
IRB/IACUC#: Protocol: 2015-112

1915 - Poster **Classification:** Faculty (Not for Competition)
Presenter: Hank Lemke **Department:** Physician Assistant Studies
Authors: Henry Lemke, UNT Health Science Center; Jeffrey Williams, UT Southwestern; Venetia Orcutt, UT Southwestern

Factors Influencing Selection and Retention of Primary Care Practice by Texas Physician Assistants: A Mixed Methods Approach

Purpose: Identify and describe factors that influence Texas Physician Assistant (PA) graduates to initially select and/or remain in primary care practice. We sought to answer these questions: 1) What factors influence PA graduates to select and/or remain in primary care in Texas? 2) How do these factors influence the PA's choice to initially select and/or remain in primary care? and, 3) Based on factors explored, can strategies be developed to enhance placement of graduates in primary care settings?

Methods: PA licensure data was extracted from the Texas Medical Board to determine graduate characteristics from 3 of 8 Texas PA programs, including age, gender, ethnicity, race, years since graduation and current practice type. A stratified purposeful sampling frame was used to identify subjects for participation in scripted telephone interviews. Transcripts were analyzed to identify, code, and sort emerging themes using NVivo 10 (QSR International, Australia).

Results: 1556 licensed PAs were identified from 3 participating Texas PA programs, representing 21.5% of all licensed PAs (n=7253) in Texas as of January 2015. Of these, 35% (n=548) were practicing in primary care. Descriptive analyses revealed the majority of graduates working in primary care were female (70.6%) and white (57.5%), with a mean age of 40. A total of 24 PAs were interviewed. Factors impacting on participants' decisions to select or remain in primary care fell into 4 general themes. These were relationships developed with patients, personal gratification from "making a difference" in the lives of patients, the intellectual challenge and/or variety of problems seen in the primary care setting and the influential role of educational experiences.

Conclusions: While previous studies have examined factors influencing physician assistant career choice, this study contributes uniquely to the literature by qualitatively examining graduates perspectives on factors influencing their career decision. Our findings suggest that PAs decisions to work in primary care are motivated by similar factors as physicians. The decision to select or remain in primary care was influenced by the individual's desire for meaningful patient relationships that provide a feeling of making a difference in an environment rich with variety and intellectual challenges. Results also suggest that educational experiences can be leveraged to improve the number of PA graduates selecting primary care as a career choice.

Sponsor: Physician Assistant Education Association
IRB/IACUC#: 2015-002

1916 - Poster **Classification:** Pharmacy Student

Presenter: Diana Li **Department:** College of Pharmacy

Authors: Diana Li, UNT Health Science Center; Shara Elrod, UNT Health Science Center; David Rhoads, UNT Health Science Center; Benjamin Y. Nguyen, UNT Health Science Center

Description of Home-Based Medication Therapy Management Services in an Interprofessional Transitional Care Program Aimed at Reducing 30-Day Hospital Readmissions

Purpose: Since the establishment of the Hospital Readmission Reduction Program (HRRP) in 2012, preventing 30-day unplanned hospital readmissions is crucial for reimbursement by Centers for Medicare & Medicaid Services. Published reports have shown pharmacist interventions after hospital discharge are associated with a smaller incidence of medication errors 30 days after hospital discharge, but most of these reports include pharmacists making follow-up phone calls. No published reports have described home-based pharmacy services as a part of transitional care programs designed to reduce unplanned 30-day hospital readmissions. This project describes the inclusion of a pharmacist as a part of an interprofessional transitional care team.

Methods: Safe Transitions for the Elderly Patient (STEP) is a transitional care program for Medicaid-eligible adults at least 50 years of age who have been recently discharged from the hospital in Tarrant County, TX. Enrolled patients receive an intake home visit from a medical provider within the first 72 hours after discharge which includes referral to other STEP providers (e.g. pharmacists, physical therapists and social workers). Patients on high-risk medications, who are believed to be non-adherent to medications or need short-term medication management were referred to the pharmacist (0.3FTE) for home-based medication therapy management (MTM) services. All patient encounters are documented in an electronic health record (EHR). Risk stratification scores were calculated by including the total sum of each the following parameters: problem meds, psychiatry, polypharmacy, health literacy, patient support, prior hospitalization, and palliative care. High risk stratification scores were defined as those with 5 having or more risk factors. Descriptive statistics were used to characterize the study population. Pearson's chi-square was used to examine the association between categorical variables. Results with a p value less than .05 were considered statistically significant. Patients enrolled in the STEP program during the time pharmacists provided services were included in this analysis (August 2014 to January 2015 and October 2015 to July 2016).

Results: A total of 366 patients were enrolled in STEP during the specified time frame with 79 being seen by the pharmacist. The mean ages in those who were and were not seen by the pharmacist were 63.4 years (range 50-92) and 66.5 years (range 50-98), respectively (p=0.02). The majority of the patients seen by the pharmacist were women (72%, n=57), which was not significantly different than those not seen by the pharmacist (p=0.44). The median number of medications in those who were and were not seen by the pharmacist were 15 (range 3-38) and 11 (range 1-32), respectively (p=0.0002). Of the patients seen by the pharmacist who reported race/ethnicity, 35.4% identified as Black or African American (n=28). The proportion of all STEP patients with calculated risk stratification score was 93% (n=342). The proportion of patients with high risk stratification scores for those who were and were not seen by the pharmacist were 49% and 57%, respectively (p=0.22). The most common discharge diagnoses for patients seen by the pharmacist were heart failure and COPD exacerbations. Hospital readmission rates were not found to be significantly different in those who were seen by the pharmacist versus those who did not (10%, 14%, p=0.34).

Conclusions: Hospital readmission rates were not found to be significantly different between those patients who were seen by a pharmacist as part of a home-based interprofessional transitional care team versus those who were not. Overall hospital readmission rates were low for both groups. In this program, patients who saw the pharmacist were more likely to be younger and be taking more medications than those who did not see the pharmacist. Patients who saw the pharmacist did not have significantly higher risk stratification scores than those patients who did not see the pharmacist. More research is needed to demonstrate the benefit of home-based pharmacy transitional care services.

Sponsor: N/A
IRB/IACUC#: 2014-090

1917 - Poster **Classification:** Staff (Not For Competition)

Presenter: Surulivelrajan Mallayasamy **Department:** Pharmacotherapy
Authors: Surulivelrajan Mallayasamy, UNT Health Science Center; Michael Fossler, UNT Health Science Center, Travena Inc.; Ayyappa Chaturvedula, UNT Health Science Center

Evaluation of Effect of Adherence Patterns on the Sample Size and Power: A Simulation Study

Purpose: Adherence to medication regimens is an important factor contributing to the success of a therapy both in clinical trials and practice. The objective of our study was to evaluate the effect of adherence patterns on the sample size and power of a clinical trial using population pharmacokinetic (PK)-pharmacodynamic (PD) model-based simulations linked to quantitative adherence models.

Methods: Longitudinal plasma concentration (PK) and pharmacological effect (PD) data were simulated in n=200 individuals per each group of test and standard-of-care (SOC) in each dataset. The population PK model used was a two compartment model with oral absorption. The PD model used was an indirect response inhibitory model. Two scenarios of PK behavior, A-short half-life (~12 hours) and B-long-half life (~35 hours) were simulated by altering the clearance parameter. Two scenarios of PD behavior, C-slower onset of effect (~4 weeks) and D- faster onset (~2 weeks) were simulated by altering the fractional turnover rate. Commonly seen drug PK-PD characteristics were generated by a combination of AC, AD, BC and BD scenarios. Non-Adherence, in terms of dose omissions (0-50%), was simulated as binary variable (missing a dose-0, taking a dose-1) using a discrete time first order Markov model. Test and SOC groups varied in their potency parameter in the PD model (EC_{50}) such that test showed superior effect. Simulations were conducted using NONMEM software. The standard deviation (SD) of the effect at the 5^{th} week of treatment was calculated from the simulated data and used for power and sample size calculations assuming various effect sizes.

Results: Increasing non-adherence increased the variability (SD) of outcome in the simulated trials. The drug feature of long-half life with faster onset (BD) was more tolerant to the effects of non-adherence on statistical power. The drug feature of short half-life with slower onset (AC) was the most affected type by non-adherence. The sample size requirements could double depending on the adherence level and effect size. For smaller effect sizes, non-adherence can cause a significant drop in power and require large sample sizes.

Conclusions: The effect of non-adherence on sample size and power is a function of drug PK-PD characteristics and effect size. Careful consideration of adherence patterns in clinical trial simulations could provide a valuable tool for designing successful trials.

Sponsor: N/A
IRB/IACUC#: N/A

1918 - Poster **Classification:** Resident (Not for Competition)
Presenter: Tara Pavelek **Department:** Medical Education
Authors: Tara Pavelek, UNT Health Science Center; Christopher Rheams, Weatherford Regional Medical Center; Lisa Nash, UNT Health Science Center; Kyle Cash, UNT Health Science Center; Stephanie Finn, UNT Health Science Center

'Happiness is the Path:' An Overview of and Initial Data from a Resident Wellness Program at Weatherford Regional Medical Center

Purpose: Resident education programs are challenging-mentally, physically, and emotionally. As residents progress through the training program, the novice physicians often neglect their own wellness. Poor self-care is primarily because of poor diet, lack of exercise, lack of sleep-hygiene, and a failure to maintain healthy personal relationships. Physician burnout brings a host of collateral consequences, including an increase in mental illnesses such as mood disorders, addiction disorders, and increased rates of suicide.

Methods: Weatherford Regional Medical Center's Graduate Medical education department implemented a resident wellness program during its inaugural year. The program helps to prevent or mitigate the burnout that often accompanies residents during their training. The Resident Wellness Committee coordinates the program. The interdisciplinary team consists of Residency Coordinators, Internal Medicine faculty, and residents. The Wellness Program uses a multi-faceted approach to both prevent and screen for physician burnout that utilizes a reporting system, didactics, and events. The program has created an anonymous reporting system that is available to all hospital employees; this allows all hospital employees to voice concern regarding the well-being of our residents. Focused didactics address topics related to resident stress, burnout, and emotional exhaustion. The program holds quarterly "Wellness Events" and all residents are excused from clinical duty to attend. This fosters a supportive atmosphere and provides activities geared towards enhancing the individual's well-being. These activities include physical activity, designated personal time, and social activity to deepen interpersonal connections. The wellness committee has developed tools to evaluate and track the resident's well-being. The program uses anonymous surveys collected from the residents twice a year to evaluate for signs of burnout, depersonalization, emotional exhaustion, and a sense of personal accomplishment. Feedback from the initial surveys allows for an early assessment of the program's effectiveness. Each medical learner was asked to answer a series of questions that address personal levels of depersonalization, emotional exhaustion, and personal accomplishment. Nineteen medical learners participated in the survey (7 Internal Medicine residents, 6 students, and 6 traditional rotating interns). The scaled questions were tabulated and used to quantify each category.

Results/Conclusions: The initial study yielded promising results. The Wellness Committee looks forward to seeing the impact of these programs as they continue to gather data and responses from residents. As the program continues, the Committee will continue to assess and expand the Wellness program. Unseen and unexploited opportunities exist for improving the quality of resident professional experience and their personal lives. Wellness programs such as Weatherford Regional's also have a positive implication for the patient's quality of care. By addressing the mental wellness of the medical professional community, the pool of healthcare providers in Texas will increase both in quantity and quality.

Sponsor: N/A **IRB/IACUC#:** N/A

1919 - Poster **Classification:** TCOM DO Student

Presenter: Joshua Pavlik **Department:** Texas College of Osteopathic Medicine

Authors: Joshua Pavlik, UNT Health Science Center; Jonathan Hardy, UNT Health Science Center; Didi Ebert D.O., UNT Health Science Center

Tourniquet Usage in Modern Conflict and in Emergency Medicine

Purpose: Our purpose is to identify and summarize relevant studies concerning tourniquet usage, safety, effectiveness, and identify obstacles preventing tourniquet implementation.

Methods: Literature review covering the past 15 years of relevant studies concerning tourniquet usage in modern conflict as well as their implementation in civilian arenas.

Results: Early and aggressive tourniquet application in extremity trauma has a negligible complication rate when compared against the lifesaving potential.

Several studies list complication rates between 1% and 36%. The higher the complication rate is associated with increased tourniquet time with a cut off of 2 hours by one study.

Conclusions: Tourniquet application is a safe and effective method to control a variety of extremity hemorrhage. Early and aggressive implementation of tourniquets is indicated in patients suffering from extremity hemorrhage not easily controlled through direct pressure. Barriers to use include: improper application, inappropriate implementation, fears of tissue ischemia, ischemic sequelae, and the liabilities associated with treatment complications.

Sponsor: N/A
IRB/IACUC#: N/A

1920 - Poster **Classification:** Resident

Presenter: Joshua Payne **Department:** Orthopaedic Surgery

Authors: Joshua Payne DO, JPS Health Network; Travis Schaefer DO, UNT Health Science Center; Bryan Ming MD, UNT Health Science Center; Tyler Caton MD, JPS Health Network

Treatment of Concurrent Ipsilateral Femoral Neck and Shaft Fractures

Hypothesis: Ipsilateral femoral neck and shaft fractures occur in 6-9% of femur fractures (1), however; there is no current consensus for treatment in the Orthopaedic literature. The treatment of ipsilateral femoral neck and shaft fractures pose a technically difficult problem with nearly 60 different treatment methods (2), but no agreement exists regarding the ideal treatment method.

Material and Methods: We propose our treatment algorithm for treating these fractures, as well as our cohort of six patients treated with the aforementioned algorithm. For stable intertrochanteric fractures and femoral neck fractures, we recommend a dynamic sliding hip screw and a retrograde femoral nail. For unstable intertrochanteric fractures, we recommend treatment with a single implant (cephalomedullary nail). We treated six patients with combination hip and femoral shaft fractures at a level 1 trauma hospital from April 2016 through February of 2017. Patients ranged from 19-42 years of age.

Results: All fractures remain anatomically reduced, and have either gone on to union or are progressing to union in the expected time frame. One complication, a stiff knee below the fractures, has been reported for which the patient is still undergoing treatment.

Conclusions: Our research is ongoing, but to this point, we conclude that this is a reliable method for treating these very challenging fractures.

Sponsor: N/A
IRB/IACUC#: 2017-033

1921 - Poster **Classification:** Pharmacy Student
Presenter: Kassie Pfluger **Department:** College of Pharmacy
Authors: Kassie Pfluger, UNT Health Science Center; Annesha White, PharmD, MS, PhD, UNT Health Science Center; Kimberly Vernachio PharmD, UNT Health Science Center

Concomitant Opioid and Benzodiazepine Use: A Systematic Review

Objective: In opioid users, the concomitant use of a benzodiazepine medication is associated with an increased risk of adverse reactions and overdose due to the synergistic effects on sedation and respiratory depression. The degree to which adverse events and overdoses occur is unclear when assessing patient characteristics, dosage and formulation. The objective of this study was to review the literature on the incidence and prevalence of an adverse event or death after concomitantly taking an opioid and benzodiazepine prescription medication and to assess the impact on the formulation, dosing, or administration of the medication in overdose.

Methods: A review of the literature was performed using the following databases: PubMed, PsycINFO, the Cochrane Library, and Scopus for peer-reviewed journal articles in English to identify studies regarding concomitant benzodiazepine and opioid medication overdose in adolescents and adults for non-cancer pain August 2006 through August 2016. Relevant publications and their reference lists were reviewed to assess for inclusion criteria based upon relevance and quality. Applicable publications were reviewed and included whether outcomes of patients were clearly documented by medication use. Information on the study design, sample characteristics, purpose of study, intervention components, primary outcome, key findings and risk of bias were abstracted for each article and presented in a table. Articles were excluded from the review if concomitant use of benzodiazepine and opioid analgesic was not clear or intentional suicide was indicated as the cause of mortality. Key search terms utilized were: ‘opioid analgesic’, ‘benzodiazepine’, ‘non-cancer pain’, ‘substance-related disorders’, ‘polypharmacy’, ‘co-prescribing’, ‘illicit use’, and ‘overdose’.

Results: Findings revealed 11 articles in the literature. Results are presented in a summary of findings table. Relevant studies assessed morbidity and mortality associated with opioid and benzodiazepine use, incidence of non-prescribed medications or illicit drug use, and descriptive information on patient populations of greatest risk of overdose. Common reasons for not selecting a particular article were due to study design and incomplete information of medications within each class.

Conclusions: The prevalence of opioid and benzodiazepine misuse and abuse has warranted international attention due to the increased overdose risk with concomitant use. More information is needed regarding dosing, formulation, and particular agent for opioids and benzodiazepines. Assessment of mortality risk is lacking when comparing acute versus chronic drug users and abusers. The incidence of overdose increases as potency increases or when an illicit agent is included due to the central nervous system (CNS) depressant effects.

Sponsor: N/A
IRB/IACUC#: N/A

1922 - Poster **Classification:** TCOM DO Student

Presenter: Kristina Pham **Department:** UNT Health Pediatrics

Authors: Kristina Pham, UNT Health Science Center; Shane Fernando, UNT Health Science Center; Joyce Mauk MD, Child Study Center

Transitioning Children with Special Health Care Needs

Purpose: Children born with diseases and disabilities are living longer but continue to face a spectrum of mental and physical differences as they age. They are considered to be children with special health care needs (CSHCN) and can acquire the needed care due to higher prevalence of specially trained pediatric health professionals, but there is a lack of care and services once they transition into adults. This study aims to gather information about barriers to CSHCN transition in the North Texas area that health professionals, community leaders, and families face in order to provide evidence of health issues that needs to be addressed.

Methods: Two surveys were designed and distributed to four groups. The first survey was targeted at health care and allied health professionals while the second survey was targeted at families of CSHCN and community leaders. To create the survey, we gathered information from interviewing members of the Transition Medicine Coalition at the University of North Texas Health Science Center, reviewing literature, and engaging in a clinical preceptorship. Surveys were delivered through electronic means and will be open until a suitable power has been achieved.

Results: 60.0% of health providers report discussing transition, but only 9.5% of families/leaders report that their provider discussed it. 48% of health providers strongly disagreed that they had the capacity to provide primary care for adults with SHCN. Lack of referral options to providers knowledgeable about SHCN (42.9%) and education about what services are available for patients with SHCN (42.9%) were barriers that health providers often faced. Families/leaders reported inability to schedule timely appointments and insurance not covering services as the top two barriers. Both surveys reported behavioral therapy was the most difficult service to refer to or find.

Conclusions: There is a disparity in perceptions of health professionals discussing transition and family's reception of the counseling. Almost half of health professionals strongly felt they did not have the capacity to provide primary care for adults with SHCN. It appears that health professionals do not have many referral options for adults with SHCN. The most significant barrier for families is the inability to schedule timely appointments. This study shows that barriers to transition exist and that adult SHCN providers and services are important to address.

Sponsor: Child Study Center
IRB/IACUC#: 2017-007

1923 - Poster **Classification:** TCOM DO Student

Presenter: Rachael Price **Department:** Pediatrics

Authors: Rachael Price, UNT Health Science Center; Kimberly Farias, UNT Health Science Center; The Dang, UNT Health Science Center; Katie Lawrence, Cook Children's Medical Center; Alice Hoeft, Cook Children's Medical Center; Tyler Hamby PhD, UNT Health Science Center, Cook Children's Medical Center

Impact of Palliative Care on Healthcare Outcomes in Complex Chronic Pediatric Patients

Purpose: Palliative Care (PC) has been correlated with decreased length of stay and cost of care and with fewer ICU visits, administered medications, and medical interventions. Additionally, research has correlated PC with better quality of life, quality of care, continuity of care, and management of family needs. Through patient and family health care education, PC services are able to reduce hospitalizations and normalize the patients' lives as permitted by their medical conditions. The purpose of this research was to determine whether PC has had a positive impact on the care received by pediatric patients with complex chronic conditions at a single institution.

Methods: A retrospective investigation was conducted on all pediatric patients with complex chronic conditions who died at Cook Children's Medical Center between January 2013 and December 2014. For each patient, demographics, diseases, number of hospitalizations, and age at death were abstracted. For each patient visit, data collected included PC involvement, number of medications, length of stay, and whether a MOST form (medical orders for scope of treatment) was completed.

Results: There were 43 total patients in this study (49% male), and 12 patients had at least 1 PC visit. Patients who had at least 1 PC visit did not differ from patients with no PC visits in demographic variables, disease, age at death, or in the rate of MOST orders, but they had greater number of hospitalizations, longer lengths of stay, and less medications per day than non-PC patients.

Conclusions: The finding that PC patients had a smaller average number of medications per day could be due to the healthcare team taking into account the total effect of polypharmacy on a patient, and then selecting only the most necessary medications. The finding that PC patients had longer and more frequent hospitalizations could be due to the late initiation of PC, instead of PC's intended early application. Lack of knowledge of what PC services offers to patients, and a misconstrued view of PC services could be contributing factors to the delay in start. Frequently providers view PC as end of life care only, so its late initiation most likely biased the results. Increasing providers' knowledge of the services that PC has to offer could increase its early initiation with patients and possibly decrease the length of stay and frequency of hospitalizations.

Sponsor: Cook Children's Medical Center
IRB/IACUC#: CCHCS IRB 2015-043

1924 - Poster **Classification:** TCOM DO Student

Presenter: Alexandra Reed **Department:** Pediatrics

Authors: Alexandra Reed, UNT Health Science Center; Samantha Severson, UNT Health Science Center; Joann Welch, Cook Children's Medical Center

Identifying Problem Areas and Providing Solutions to Coordination of Care in Urgent Care to Emergency Department Transfers Within a Pediatric Health Care System

Purpose: Pediatric urgent care centers (UCCs) provide access to convenient, on demand medical care for patients who have non-emergent medical needs. Although, most patients who present to UCCs can be appropriately treated and discharged home, some patients present with medical needs outside the scope of practice for the UCC and are transferred to an emergency department (ED) for further evaluation. Currently, there are no established standards for such patients who need transfer of care from a pediatric UCC to an ED. This study examines the UCC to ED transfer process in an integrated pediatric health care system, identifies inefficiencies, and proposes a solution.

Materials and Methods: The records of all patients transferred from a suburban UCC site to the urban, high volume ED between July 1, 2015 and May 16, 2016 were retrieved from the system's transport department. Using retrospective chart review, UCC transfer diagnosis, ED discharge diagnosis, patient no shows, and those who left without being seen (LWBS).

Results: Of the 245 transfers, 14 (6%) never arrived or LWBS and, 221 (96%) of these had non-missing values on the variables of interest. The ED provider noted in the ED record that the patient was a transfer from the system's UCC in 167 (76%) cases. However, the review the UCC record was documented in only 58 (26%) cases. The patient was subsequently admitted to the ED in 51 (23%) cases. Using logistic regression, results showed that ED providers were more likely to review the UCC record when the chart stated that the patient was sent from the UCC ($P < .001$, OR = 7.78) and when the patient was admitted ($P < .001$ OR = 3.29).

Conclusions: This study revealed that in 1 out of 4 cases the ED providers were not aware that the patient was transferred from the UCC. Additionally, in 3 out of 4 known UCC transfers, the ED providers didn't review the transfer records. These results demonstrate that the transfer of information from the UCC to ED during the transfer process has many opportunities for improvement. Based on these findings, a quality improvement initiative was implemented in November 2016: UCC providers now place bands on patients, who are to be transferred to the ED to signify to the ED staff that the patient was transferred. In summer 2017, transfer data based on this program will be compared to the results above to examine the efficacy of this initiative.

Sponsor: Cook Children's Summer Research Program
IRB/IACUC#: CCHCS IRB

1925 - Poster **Classification:** GSBS Student

Presenter: Conner Reynolds **Department:** Non UNTHSC

Authors: Conner Reynolds, UNT Health Science Center; Kathleen Traylor, UNT Health Science Center; Catherine Sembajwe-Reeves, UNT Health Science Center

Enhancing Healthcare Quality Research Efforts at UNTHSC: A Three-Phase Plan for Interprofessional, Student-Driven Projects

Background: According to recent epidemiological studies, medical error is the third leading cause of patient death in the United States. There are also many factors independent of delivery that prevent access to healthcare altogether, including lack of health insurance coverage, the financial burden of healthcare, and having a usual source of care. In order to fully optimize patient health, the practical implementation of care must be addressed. On May 17, 2016, in collaboration with Texas Christian University, John-Petersmith Health Network, and Cook Children's Medical Center, the University of North Texas Health Science Center (UNTHSC) launched its Institute for Patient Safety (IPS). This institute aims to improve healthcare throughout the nation, by patient-centered, interprofessional initiatives that directly impact healthcare safety, delivery, and accessibility.

Aim: The UNTHSC Institute for Healthcare Improvement (IHI) Chapter seeks to fortify IPS efforts by increasing student involvement in quality improvement projects.

Methods: To achieve this aim we propose a three phase plan, utilizing students from a variety of academic and healthcare professional track backgrounds. In Phase 1, interprofessional teams will collaboratively generate a Needs Assessment Survey (NAS) to determine needs within a chosen target population. In Phase 2, subgroups will use NAS results to drive design and implementation of quality improvement measures from multiple healthcare professional levels. In Phase 3, all students will contribute to establishing a new NAS group, thus ensuring the stable growth and sustainability of new quality improvement at UNTHSC.

Conclusions: We believe this plan is uniquely suited for UNTHSC, utilizing the breadth of healthcare specialties present on campus in a mission towards substantial improvement for target populations in North Texas.

Sponsor: N/A
IRB/IACUC#: N/A

1926 - Poster **Classification:** Faculty (Not for Competition)
Presenter: Sarah E. Ross **Department:** Geriatrics
Authors: Sarah Ross, UNT Health Science Center; Jennifer Severance, UNT Health Science Center

Implementation of TeamSTEPPS For Patient Safety In Long Term Care Settings

Purpose: Patient safety is a recognized component to reducing hospital readmissions and preventable adverse events, although little is known about improving patient safety in skilled nursing settings that have an increasingly frailer and more dependent patient population due to shorter inpatient hospital stays. With a long term goal of improving the safety and quality of care provided to skilled nursing facilities (SNF), the University of North Texas Health Science Centers' Center for Geriatrics will use a case study method to evaluate factors related to the implementation of a patient safety improvement intervention in SNF.

Methods: The research team will review SNF data from secondary data sources reporting on CMS quality measures over a twelve month period to assess facility characteristics and facility performance and patient outcomes against national benchmarks. The research team will develop and implement the TeamSTEPPS Long Term Care program at the two SNF in Fort Worth, Texas, with each case defined as an individual facility. The research team will work with SNF leadership, including the Medical Director, Director of Nursing, and a licensed administrator. Implementation will occur in three phases outlined by the TeamSTEPPS program: Phase 1) conduct the patient safety culture assessment using the Agency for Healthcare Research and Quality (AHRQ) Patient Safety Culture Survey; Phase 2) develop performance goals and an action plan of delivering customized training on patient safety areas prioritized through the data review and patient safety culture assessment; and Phase 3) conduct patient safety training and monitor performance of action plan items. Research team members will conduct open-ended and structured interviews with facility staff to gather data on their opinions about processes and facts related to implementation. The research team will also document activities in each phase of implementation. This exploratory data will be combined with process measures established during the action plan phase to conduct a holistic investigation of the implementation processes.

Results: Research will be conducted at Trinity Terrace and Brookdale Cityview skilled nursing facilities in Fort Worth, Texas. Quality improvement teams will be formed at each center to complete the TeamSTEPPS training and monitor the implementation of patient safety initiatives that increase the capacity of skilled nursing facilities to implement team approaches in quality improvement activities, and increase the ability of skilled nursing facilities to improve patient safety.

Conclusions: This exploration of TeamSTEPPS implementation will develop a replicable model of implementation to improve patient safety in SNF that will improve the health status of skilled nursing facility patients.

Sponsor: UNTHSC Institue for Patient Safety
IRB/IACUC#: 2017-017

1927 - Poster **Classification:** Staff (Not For Competition)
Presenter: Cynthia Loza **Department:** Information Services
Authors: Sarah Ross, UNT Health Science Center; Cynthia Loza, UNT Health Science Center; Leslie Henderson, UNT Health Science Center; Sandra Booker, UNT Health Science Center; Subhada Prasad, UNT Health Science Center

Strategies for Promotion of a Patient Portal in the UNT Geriatrics Clinic for Improved Satisfaction and Access

Purpose: The use of electronic health records has become a vital part of patient care. Electronic health records have many benefits, including assisting providers with tracking tasks important for health maintenance and chronic disease management. Electronic health records also have patient portals, which are secure online websites that give patients access to their personal health information. NexGen is the electronic health records system used at the University of North Texas Health Sciences Center, and we have recently started using their Patient Portal. Our team has worked on promotion and training in the patient portal to assist with participation by both clinical staff and patients. The goal is improve patient and caregiver access to their personal health information, improved satisfaction, and improved communication with their care team. Additionally, the patient portal will support improved chronic disease management by providing a way to send electronic messages to patients with reminders of any necessary testing or notifications of any educational programs relevant to their condition. In the Geriatric population, we want to make use of a patient portal user friendly for those with low computer literacy and also usable by caregivers of patients with cognitive impairments.

Methods: The team has used several tools for promotion of the patient portal. A video was produced to train staff on how to enroll patients in the portal and how view messages receive through the portal. A kiosk was set up in the waiting room of the UNT Geriatrics clinic with student volunteers to assist patients one-on-one with enrollment. Buttons for advertisement and awareness were distributed to office staff. We also created an icon in NexGen to easily recognize which patients have already enrolled. When the goal of 60% enrollment is achieved, the team plans to evaluate outcomes of improved access and satisfaction. Both a general and a patient portal specific patient satisfaction survey will be distributed to the UNT Geriatrics patients. We will also compare communication received from patients by phone which electronic communication through the patient portal.

Results/Conclusions: Enrollment in the NexGen patient portal in the UNT Geriatrics clinic is on the rise. Patients who are participating have enjoyed the ability to email their care team with questions. In particular, we have had success in providing improved access for our hearing impaired patient, as the Geriatrics office staff have emailed for coordination of acute appointments to address urgent needs. As more patients and caregivers utilize this tool we hope to show improved patient satisfaction. Regarding access to the care team, we anticipate a slight decrease in phone calls with more use of the patient portal for electronic communication. Adjustments to the patient portal will be made over time to ensure that it is patient centered and providing patients and caregivers with the information they need to manage their health.

Sponsor: N/A
IRB/IACUC#: 2010-092

1928 - Poster **Classification:** Resident

Presenter: Ryan Rowland, MD **Department:** Orthopaedic Surgery

Authors: Ryan Rowland, JPS Health Network; Arvind Nana, JPS Health Network; Victor Kosmopoulos, UNT Health Science Center; Shiv Patel, JPS Health Network; Morgan Smith, UNT Health Science Center

Effect of Screw Type and Pilot Hole on Screw Fixation in Osteoporotic Metaphyseal Bone

Introduction: Osteoporosis is a disease in which weakening of the bone occurs due to increased bone resorption and/or decreased bone deposition. Adequate screw fixation can be difficult to achieve in osteoporotic bone leading to hardware loosening or failure. With the steady increase in the number of geriatric fractures as well as the incidence of osteoporosis, it is important to investigate the relationship between screw type and pilot hole diameter in order to use the best combination when fixating screws in osteoporotic bone. Thus, this study aims to compare osteoporotic bone screw fixation using cortical and cancellous screws placed with two different pilot holes. Fixation success was mechanically evaluated using screw pullout strength and stiffness.

Methods: Eighty osteoporotic metaphyseal sawbone model blocks (10# cellular foam 40 mm thick, laminated on 1 side with 20# solid foam 3 mm thick, finished dimension 40x40x43 mm, standard tolerances; Pacific Research Laboratories Inc., Vashon, WA) were equally divided into 2 separate groups. Forty blocks received 2.0 mm pilot holes and the other forty 2.5 mm pilot holes. Each of the two different pilot hole groups then had a total of twenty 3.5 mm cortical screws and twenty 3.5 mm cancellous screws placed by a junior resident and a staff orthopedic surgeon. This resulted in the following four, 20 sample, testing configurations: (A) 3.5 mm cortical, 2.5 mm pilot; (B) 3.5 mm cortical, 2.0 mm pilot; (C) 3.5 mm cancellous, 2.5 mm pilot; and (D) 3.5 mm cancellous, 2.0 mm pilot. Pullout strength and stiffness were studied using a material testing system (MTS 858 Mini Bionix, MTS Systems Corp., Eden Prairie, MN) following the American Society for Testing and Materials standard (ASTM F543-13). A two-way balanced ANOVA was used to compare and identify differences between the 4 different configurations.

Results: Configuration (D) resulted in the highest mean pullout strength (481.4 N) and stiffness (557.8 N/mm) and was thus the best configuration for this bone type. The 2.0 mm pilot holes outperformed the 2.5 mm pilot holes for each screw type. Furthermore, the 2.0 mm pilot holes were more important in the success of fixation than the type of screw. These conclusions are evident when comparing the resulting 372.2 N and 433.4 N pullout strengths of configurations (A) and (B), respectively, and the 433.4 N and 413.2 N pullout strengths of configurations (B) and (C). Significant differences in pullout strength ($p=1.17e-5$) and stiffness ($p=0.0087$) were found between different pilot holes. Significant differences were also found in pullout strength ($p=0.0018$) but not stiffness ($p=0.3022$) between the different screw types.

Conclusions: With the incidence of osteoporosis on the rise, there is a need for improved hardware fixation. The results from this study support the use of configuration (D) for this type of bone. This configuration, with the 3.5 mm cancellous screw and the 2.0 mm pilot hole, resulted in highest pullout strength and stiffness as compared to the others tested in this study. Furthermore, the results show that pilot hole size is more important in successful fixation than screw type.

Sponsor: N/A
IRB/IACUC#: N/A

1929 - Poster **Classification:** Pharmacy Student

Presenter: Ngan Tran **Department:** Pharmacy

Authors: Ngan Tran, UNT System College of Pharmacy; Annesha White, UNT System College of Pharmacy; Emanuel George, UNT System College of Pharmacy; Michell Butler, Mercer Health Sciences Center College of Pharmacy

Decreasing Inefficiencies in the Community Pharmacy Setting: Addressing the Top Issues in Patient Centered Care

Objective: The objective of this study was to review the literature in the last decade regarding inefficiencies in the community setting with respect to patient centered care. A 2013 study showed that 46.3% of 162 indemnity claims paid to patients due to a medication error were attributed to independent community pharmacies, while 34.6% from chain pharmacies. Additionally, 43.8% of all claims paid were a result of the patients' injuries due to dispensing error. Sources for dispensing errors included: patient misidentification, improper computer coding, and nonadherence. Nonadherence is estimated at $300 billion annually. In contrast to the institutional setting, there is lack of literature emphasizing the inefficiencies in the community setting.

Methods: Articles identified from electronic databases, Google Scholar, PubMed, and Scopus, from January 2006 to December 2016, were summarized in a table. A diagram and a visual display were created to represent an ideal community pharmacy of the future. Key search terms were "community pharmacy and efficiencies", "community pharmacy and inefficiencies", "retail pharmacy and efficiencies", "retail pharmacy and inefficiencies", "retail pharmacy workflow", "retail pharmacy medical error", "retail pharmacy dispensing error", "dispensing error cost", "patient centered care", and "nonadherence".

Results: Seventeen articles and reports identified were categorized into inefficiencies associated with workflow and patient nonadherence. Inefficient workflow leads to prescription errors, time loss, and decrease in patient care. Moreover, the generic layout of the pharmacy creates a barrier in pharmacist-patient interaction. Also, prescription abandonment added unnecessary labor and resulted in poor patient outcome.

Conclusions: A more efficient, patient centered care layout of the pharmacy is proposed utilizing the six-sigma tools to drive process improvement in the pharmacy. Although studies shows tools and technologies are available to increase efficiency, utilization remains low. This study highlights the benefits of incorporating technology to improve pharmacy operations. Maximizing technology may give pharmacists more time for patient-centered care service.

Sponsor: N/A
IRB/IACUC#: N/A

1930 - Poster **Classification:** TCOM DO Student

Presenter: Akanksha Verma **Department:** Nephrology

Authors: Akanksha Verma, UNT Health Science Center; Brenda Ma, UNT Health Science Center; Tyler Hamby PhD, Cook Children's Medical Center; Robert S. Gillespie MD, Cook Children's Medical Center

"Kidney Bucks": An Incentives Program for Pediatric Dialysis Patients

Background: Pediatric dialysis patients are at risk for a variety of metabolic derangements, including hyperkalemia, hyperphosphatemia, and fluid overload. Management of these problems includes patient education, dietary restrictions, and the use of phosphate-binding medications.

Hypothesis: The purpose of the present research is to examine the efficacy of an incentives program, “Kidney Bucks”, which offers rewards in exchange for fluid control and normal lab values for phosphorus and potassium.

Methods: The study was a retrospective investigation initiated in January 2015 at Cook Children’s Medical Center (CCMC). To be included in this study, patients had to be dialysis patients from July 2014 to June 2015, and had to be between the ages of 5 and 21 during this time. Longitudinal analyses were utilized to test whether the amounts of Kidney Bucks earned--overall and for each of the three components--differed before and after the intervention. For this purpose, the amount of Kidney Bucks that patients would have hypothetically earned preintervention in 2014 was computed and compared to the amount actually earned postintervention in 2015. Fourteen peritoneal dialysis patients and 13 hemodialysis patients met the inclusion criteria, totaling 27 patients.

Results: Peritoneal dialysis (P=.01) patients earned more Kidney Bucks overall postintervention. Hemodialysis (P=.02), but not peritoneal dialysis, patients earned more Kidney Bucks for potassium postintervention, but neither group differed in phosphorus values. Lastly, peritoneal dialysis, but not hemodialysis, patients earned much more Kidney Bucks for fluid control post-intervention (P<.0001). Importantly, the most significant improvement post-intervention was seen in the peritoneal group for fluid control, which was the single behavioral criterion for earning Kidney Bucks.

Conclusions: The study’s limitations include the relatively small sample size and the retrospective design. This study has important implications for practitioners who face the challenge of dietary adherence in pediatric populations and, despite its limitations, serves as a good foundation for future studies.

Sponsor: N/A
IRB/IACUC#: CCHCS IRB 2016-042

1931 - Poster **Classification:** TCOM DO Student

Presenter: Ashleigh Workman **Department:** UNT Health

Authors: Ashleigh Workman OMS-III, UNT Health Science Center; Heather Reagin OMS-III, UNT Health Science Center; Stephen Weis D.O., UNT Health Science Center

Severe Psoriatic Disease in the Setting of Hypocalcemia

Purpose: To present a patient suffering from severe psoriatic disease in the setting of hypocalcemia and determine the best treatment.

Methods: N/A

Results: The patient's psoriatic plaques cleared three months after presentation when she had achieved normocalcemia with 0.75 mcg calcitriol.

Conclusions: Psoriasis is a chronic, inflammatory, systemic disease that affects approximately three percent of the US adult population. While its exact cause is uncertain, it is thought to be an autoimmune disorder. There have been very rare cases of psoriasis developing in patients with hypocalcemia. Treatment of such patients is directed at restoring the calcium to the normal range, not immunosuppressive medications.

Sponsor: N/A
IRB/IACUC#: 2017-035

2000 - Poster **Classification:** Pharmacy Student
Presenter: Irin Tanaudommongkon **Department:** Pharmaceutical Science
Authors: Irin Tanaudommongkon, UNT Health Science Center; Asama Tanaudommongkon, UNT Health Science Center; Jing Zhu, UNT Health Science Center; Soma Afrasiabian, UNT Health Science Center; Xiaowei Dong, UNT Health Science Center

Subcutaneous Injection of In Situ Self-assembly Nanoparticle to Encapsulate Lopinavir and Ritonavir

Purpose: Lopinavir (LPV) is one of the potent protease inhibitors (PI) that is used for the treatment of human immunodeficiency virus (HIV) infection. However, LPV has poor bioavailability when it is administered orally due to undergoing first-pass metabolism by hepatic cytochrome P450 (CYP) 3A4 isoenzyme, therefore LPV is a coformulated combination with ritonavir (RTV), another PI, to inhibit CYP3A4. Despite this advantage, oral LPV/RTV pill does not address non-adherence issues and gastrointestinal side (GI) effects. Long-acting injectable nanoformulations offers alternative therapeutic options for the treatment of HIV. Injectable nanoparticle has the potential to improve the pharmacokinetic properties of drug molecules, overcome GI side effects, and bypass first pass metabolism. The goal of this study was to develop a novel long-acting injectable nanoformulation to encapsulate LPV and RTV by using the in situ self-assembly nanoparticle (ISNP).

Methods: The preparation of LPV/RTV ISNPs was performed by the ISNP nanotechnology. The drug loading, drug entrapment efficiency and in-vitro release of NPs were measured by using HPLC. Particle size was determined by using a particle size analyzer. Rats were treated with 100 µl of LPV/RTV ISNPs to provide 100 mg/kg of LPV by subcutaneous injection. Then, blood was collected at predetermined time points. LPV and RTV concentrations in the plasma of rats were determined by LC-MS.

Results: LPV/RTV ISNPs were 167.8 nm with a narrow distribution of P.I. 98% for both RTV and LPV. The drug loadings were 23.5% for LPV and 5.9% for RTV. LPV and RTV exhibited sustained release profiles. Slow release rate of LPV was observed at about 20% on day 5 and followed by the sustained release beyond 14 days. RTV releases faster than LPV in the first 5 days and slower afterward when compared to LPV. LPV C_{trough} in plasma remained above 160 ng/ml, and RTV C_{trough} was about 50 ng/ml with one subcutaneous (subQ) injection in rats for 6 days.

Conclusions: We successfully prepared LPV/RTV ISNPs as lipid-based long-acting injection by using the ISNP nanotechnology. LPV/RTV ISNPs exhibited a sustained release behavior in both in-vivo and in-vitro studies.

Sponsor: N/A
IRB/IACUC#: 2013/14-12-A05

Pharmacology (Abstracts in the 2100s)

2100 - Poster **Classification:** SPH Student
Presenter: Rashmi Deshmukh **Department:** Pharmacology & Neuroscience
Authors: Rashmi Deshmukh, UNT Health Science Center; Dhwanil Dalwadi, UNT Health Science Center; Huanyu Wang, UNT Health Science Center; John A. Schetz, UNT Health Science Center

Creation of a Technology Platform for Fighting Mosquito Bites

Objective: Octopamine receptor (OctR) based deterrents are a potentially better way of preventing mosquito bites, because the mechanism of action is not toxicity which encourages resistance. The OctR belongs to a class of primitive heterotrimeric G protein-coupled receptors (GCPR) found only in invertebrates and plays an important role in biting-related behaviors. This study focuses on developing a testing system that will accelerate the discovery of ecofriendly deterrents free of the perils of current repellent technologies.

Materials and Methods: The Anopheles gambiae mosquito which is the vector for malaria was recently reported to have two splice variants of an OctR gene named AgAOctR and AgBOctR that have N-terminal halves in common. The full length AgBOctR sequence was obtained by removing the C-terminal half of the AgAOctR with restriction enzymes and ligating its remaining N-terminal region with the unique half of the synthesized AgBOctR sequence. The AgBOctR gene was then functionally expressed in mammalian cells via calcium phosphate-mediated transfection. Radioligand binding was then used to detect the functionally expressed proteins in transfected cells and stable clones were selected. Fluorescent detection of changes in intracellular calcium was used as a measure of activation of the G_q-PLC-IP_3-Ca^{2+}-mediated signaling pathway.

Results: Differential restriction digest followed by size determination via agarose gel electrophoresis of the newly created AgBOctR sequence was used to verify its length and composition. When expressed in mammalian cells the AgBOctR gene was found to code for a protein that specifically binds an octopamine receptor radioligand, while no specific radioligand binding was detected in untransfected cells. Further these AgBOctR-expressing cells were activated by octopamine with a higher potency than tyramine indicating that the gene truly encodes for an octopamine receptor rather than a closely related tyramine receptor. That OctR signaling could be readily detected via monitoring of the G_q-PLC-IP_3-Ca^{2+} signaling pathway suggests that AgBOctR is specifically an alpha-like OctR, because beta-like OctRs utilize a different signaling pathway.

Conclusions: A technology system has been created that will allow us to correlate the mosquito OctR activity of compounds with their ability to prevent mosquito biting. This will accelerate the discovery of innovative mosquito deterrents that prevent infectious disease transmission.

Sponsor: Animal Biotech and G67673
IRB/IACUC#: N/A

2101 - Poster **Classification:** TCOM DO Student

Presenter: Daniel L. McMahan **Department:** Graduate School of Biomedical Sciences
Authors: Daniel McMahan, UNT Health Science Center; Michael Forster, UNT Health Science Center

Modafinil as a Pharmaceutical Therapy for Cocaine Withdrawal

Purpose: Modafinil has been proposed as a possible pharmaceutical adjunct therapy for cocaine withdrawal. This study tested Modafinil's interaction with cocaine to determine its usefulness in a clinical setting.

Materials and Methods: This study used a total of 48 mice separated into the following groups of 8 mice each:

Group 1 – Dose 1 [5 mg Modafinil] + Dose 2 [Vehicle (Saline)]

Group 2 – Dose 1 [10 mg Modafinil] + Dose 2 [Vehicle (Saline)]

Group 3 – Dose 1 [5 mg Modafinil] + Dose 2 [8 mg Cocaine]

Group 4 – Dose 1 [10 mg Modafinil] + Dose 2 [8 mg Cocaine]

Group 5 – Dose 1 [Vehicle (Methyl Cellulose)] + Dose 2 [8 mg Cocaine]

Group 6 – Dose 1 [Vehicle (Methyl Cellulose)] + Dose 2 [Vehicle (Saline)]

*Each dose contained 0.33 mL of bracketed [] solution.

All Modafinil drug preparations were made by mixing Modafinil with methyl cellulose. A 25G needle was used to inject "Dose 1" (Modafinil drug preparation) into the left-lower abdominal quadrant of Groups 1-4. The same gauge needle was also used for injecting "Dose 1" to Groups 5-6; however, these doses excluded Modafinil and only contained methyl cellulose.

All Cocaine drug preparations were made by mixing Cocaine with normal saline. A 28G needle was used to inject "Dose 2" (Cocaine drug preparation) into a different location in the left-lower abdominal quadrant of Groups 3-5. The same gauge needle was also used for injecting "Dose 2" to Groups 1, 2, 6; however, these doses excluded Cocaine and only contained normal saline.

All groups of mice were given "Dose 1" and allowed to wait for 15 minutes ("pretreatment time"). After this pretreatment time, all groups of mice were administered "Dose 2" and immediately placed in separate locomotor activity ("LMA") boxes for 120 minutes. The data was obtained from said LMA boxes and analyzed to determine the effects of the above various concentrations of drugs on the mice' locomotor activity.

Summary: The average horizontal ambulation count for Group 6 was 2,586. This was used as a baseline for judging the effects of the various drug combinations. The average horizontal ambulation count for the remaining groups was as follows: Group 1 – 3,265; Group 2 – 3,741; Group 3 – 4,436; Group 4 – 5,508; Group 5 – 3,434. In summary, Modafinil alone increased the locomotor activity above baseline in proportion to its dosage. When cocaine was subsequently added, the ambulation count grew even higher.

Conclusions: This study suggests that Modafinil and cocaine act via a common pathway. It is known that Modafinil is an atypical inhibitor of the dopamine transporter (DAT) and cocaine is a typical inhibitor of DAT. It is hypothesized that this pathway is responsible for the increased locomotor activity observed in this study. The results obtained suggest that Modafinil and cocaine in combination produce an additive effect on locomotor activity in mice. Increasing the Modafinil dosage from 5-10mg, while leaving cocaine constant at 8 mg, produced an increased ambulation count. Further testing must be done in order to elucidate whether or not cocaine and Modafinil truly act via a common pathway. It is suggested that repeating this study by using a 20 mg cocaine dosage would effectively answer this question. Prior research suggests that administering >20mg cocaine to mice effectively decreases locomotor activity; therefore, progressive decreases in locomotor activity when administering progressive increases in Modafinil in combination with a constant 20 mg dose of cocaine would suggest that Modafinil acts via a common pathway. This research would need to be conducted before a judgment could be made regarding Modafinil's value in treating cocaine withdrawal.

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2102 - Poster **Classification:** Pharmacy Student

Presenter: Patra Rungruangphol **Department:** College of Pharmacy
Authors: Patra Rungruangphol, UNT Health Science Center; Annesha White, PharmD, MS, PhD, UNT Health Science Center

A Multidisciplinary Team-Based Approach to Reduce Non-Alcoholic Fatty Liver Disease-Related Fibrosis in Patients with Psoriasis

Purpose: Psoriasis impacts approximately 7.5 million people in the United States and recent studies support the link between psoriasis and non-alcoholic fatty liver disease (NALFD). The majority of psoriasis patients are not being screened for NAFLD. All clinicians must be aware of this association so they can recognize and provide a proper follow-up and medication selection in psoriasis patients to prevent NAFLD. The aim of this review is to explore the current evidence within the last decade with respect to the association between the pathophysiological mechanisms of psoriasis and NAFLD. A secondary aim is to highlight the importance of utilizing a multidisciplinary patient care team to manage moderate-to-severe psoriasis.

Methods: A systematic review was conducted using Pubmed, Scopus, and International Pharmaceutical Abstracts databases between 2006-2016. Key search terms included 'Psoriasis,' 'Patient Care Team,' 'Multidisciplinary approach,' 'Metabolic Disease,' 'Obesity,' 'Psoriatic Arthritis,' and 'Mental disorders.' Abstracts were screened against inclusion criteria and selected based upon relevance and quality. Randomized controlled trials, prospective and retrospective studies were excluded if they were not in English or lacked information on moderate and severe psoriasis. Once articles were retrieved, they were evaluated based on the Oxford Centre for Evidence-Based Medicine and summarized in a table structured by Title, Author, Research Question, Inclusion Criteria, Resources, Findings, and Quality.

Results: The search yielded a total of 33 studies for review. The articles retrieved have shown a strong association between NAFLD and psoriasis. Psoriasis patients should be routinely screened for NAFLD and the presence of NAFLD should be taken into consideration when choosing pharmacological treatment to reduce the progression of liver disease. Multidisciplinary patient care team management (pharmacists, dermatologists, psychologists and dietitians) should include monitoring for metabolic disease, osteoporosis, and mental health assessment.

Conclusions: Psoriasis patients who have multiple comorbidities can benefit from multidisciplinary team care. A unique opportunity exists to screen psoriasis patients with multiple comorbidities or not well managed on current therapy for NAFLD, which is predicted to be the leading cause of liver transplantation by 2020. Few studies have explored the supportive role of pharmacists for patients with psoriasis. Future research is warranted.

Sponsor: N/A
IRB/IACUC#: N/A

2103 - Poster **Classification:** Pharmacy Student

Presenter: Rushil Sureja **Department:** Pharmacy

Authors: Bradley Slate, UNT Health Science Center; Rushil Sureja, UNT Health Science Center; Annesha White, UNT Health Science Center; Kimberly Vernachio, UNT Health Science Center

Concurrent Use of Benzodiazepine with Buprenorphine and Potential Risks for ADRs and Overdose

Objective: Benzodiazepines (BZDs) are known to negate the "plateau" properties of buprenorphine, concealing the purported safety advantages of buprenorphine vs. other opioids. One question is, does the literature show an increase in overdose or respiratory depression when these two drugs are combined, and whether the benefits of using the combination equal the risk of other opioids that do not have buprenorphine's partial agonist/antagonist properties? The objective of this study was to examine the literature within the last decade and determine if combined use of BZDs with buprenorphine increased the risk for adverse drug reactions or overdose.

Methods: Journal articles were retrieved through the databases PubMed and Google Scholar from January 2007 to January 2017. The journal articles keywords were: 'BZDs, 'buprenorphine', 'pain', and 'opioids'. Articles were selected to include adverse effect, overdose, and death-potential when BZDs were used with buprenorphine. Articles that focused on the effect that dose or formulation had on severity were utilized to give context to the severity of coadministration. The articles were graded using Oxford Center of Evidence Based Medicine to address bias.

Results: A total of eight peer-reviewed studies were used, representing both randomized controlled trials and observational studies. The sample sizes of the examined studies ranged from 72 to 692. Due to the low number of existing studies at this time, there is insufficient evidence to determine if the benefits of concurrent use of BZDs and buprenorphine outweigh the risks of serious, and sometimes fatal, adverse effects. However, animal research revealed that using a lower strength BZD will reduce adverse effects significantly.

Conclusions: The literature supports the risk of accidental overdose and death in the use of opioids and BZDs. Although there is little published research, there is support for our hypothesis in that a significant degree of adverse events and overdose were realized once the buprenorphine component was added to BZDs. There appears to be a large amount of variability in severity depending on the administered dose. Future research, including an observational study, will provide valuable information.

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IRB/IACUC#: N/A

2104 - Poster **Classification:** Pharmacy Student

Presenter: Nora Snoubar **Department:** Pharmacy

Authors: Nora Snoubar, UNT Health Science Center; Annesha White, PharmD, MS, PhD, UNT Health Science Center; Seina Lee, PharmD, MS, Janssen Pharmaceutical Companies of Johnson & Johnson; Silky W. Beaty, PharmD, MSPH, Express Scripts

Authentic Leadership in Managed Care Pharmacy: Career Advice for Pharmacy Students and Professionals

Background: Descriptive summaries and research on influential factors affecting leadership among student pharmacists career choices has been utilized by practitioners to aid student development, enhance educational experiences, and plan for future career goals. There is currently little research that summarizes different managed care focused leadership paths for student pharmacists as they advance their career.

Objective: The purposes of this research are to (1) review the literature from the past decade on managed care pharmacy leadership paths and (2) describe the views of experienced pharmacists with regard to leadership in managed care.

Methods: A literature search of various healthcare journal databases, including Medline and Pubmed, was conducted using keywords leadership in managed pharmacy, careers in managed care pharmacy, and career planning for pharmacy. The full text of each article was reviewed and articles were excluded if they did not relate directly. Additionally, 15 experienced pharmacists were interviewed on managed care leadership development. Data was analyzed qualitatively using NVIVO software to identify common themes and word frequencies.

Results: Fifteen different managed care pharmacy careers were identified based on the results of the literature search. Specific requirements for leadership paths were noted. Some of the leadership positions listed were pharmacists in the community, hospital, PBM, consultant and pharmaceutical industry settings. Qualitative analysis of pharmacists' interviews revealed that goals were to remain in a leadership position for at least 10 years and to leave with people who were prepared to take over the department. Furthermore, the pharmacists interviewed suggested creating a career roadmap, the importance of identifying how to progress or change career paths, and a focus on obtaining a good mentor.

Conclusions: This research has presented many contemporary leadership paths in the managed care arena. Pharmacists' insights are provided from experience, which could serve as a great resource for student pharmacists for their career planning and development. Identifying how to progress or change career paths will allow for a smooth transition into a new era in which pharmacists are critical components of every health care team. A strong leadership pipeline is key to future of the pharmacy profession.

Sponsor: N/A
IRB/IACUC#: N/A

Physical Medicine / OMM (Abstracts in the 2200s)

2200 - Poster **Classification:** Faculty (Not for Competition)
Presenter: Eric Arguello **Department:** Physical Therapy Program
Authors: Eric Arguello, UNT Health Science Center; Hao Liu, UNT Health Science Center; Tony Truong, Fit Steps for Life; Clayton Holmes, UNT Health Science Center; Howe Liu, UNT Health Science Center

Variation of the Origins of the Phrenic and Long Thoracic Nerves – A Case Report

Introduction: In humans the phrenic nerve originates from the convergence of 3 individual nerve branches off the spinal roots of C3-C5, while the long thoracic nerve originates from the convergence of 3 branches off the spinal roots of C5-C7. However, a variation of the origins of these two nerves was found in a cadaver during dissection.

Methods: This study of anatomical variation was conducted on an 86-year-old male cadaver provided for physical therapy students in a gross anatomy lab. Students and faculty members dissected the cadaver. The variations were identified when the neck and brachial areas were exposed for students to study.

Results: On the left neck area, a short communicating nerve trunk is found connecting the beginning parts of both the cervical plexus and upper trunk of the brachial plexus. The phrenic nerve is the only branch off this communicating nerve and travels along the anterior surface of anterior scalene muscle. At the origin of this phrenic nerve, a small muscular branch divides and passes posteriorly to innervate the middle scalene muscle. On the right axillary area, the long thoracic nerve is found to branch off from the end of the posterior cord or initial part of the radial nerve of the brachial plexus and then travels distally and inferiorly to innervate the serratus anterior muscle.

Conclusions: Findings of variation of the phrenic and long thoracic nerves in this study may provide additional information for clinicians to understand potential injury related to these two nerves. It is possible that an overstretch to the upper trunk of brachial plexus like with Erb-Duchenne palsy or a lesion to the posterior cord or initial portion of the radial nerve may cause involvement of injury to the phrenic and long thoracic nerves

Sponsor: N/A
IRB/IACUC#: N/A

2201 - Poster **Classification:** Postdoctoral Fellow

Presenter: Xiao Bao **Department:** Physical Therapy

Authors: Xiao Bao, UNT Health Science Center; Stephen Baker, UNT Health Science Center; Yasser Salem, UNT Health Science Center; Myla Quiben, UNT Health Science Center; Howe Liu, UNT Health Science Center

The Effect and Mechanism of Botulinum Toxin Type A For Knee Osteoarthritis Through Ultrasound Guidance

Objective: Knee osteoarthritis (OA) is a chronic and progressive disease that affects the geriatric population. OA is characterized by cartilaginous degeneration, subcartilaginous bone reconstruction and osteophyte formation. It causes joint pain, swelling, joint dysfunction and affects the quality of life, even leading to depression. The treatment of knee osteoarthritis usually includes medications, physical therapy and traditional Chinese acupuncture. These treatments could be useful for most of OA. Refractory OA in which conventional treatment is ineffective could induce intensive pain, disability and reduce the life quality of the patient. Given that, we need obtain new methods with good curative effect for refractory OA.

BoNT-A is the marketing name given to a neurotoxin and is found to be effective for partial muscle spasm of post-stroke. Recently the use of BoNT-A is extended to be used as pain management in conditions such as low back pain and myofascial pain. Usually, injection of BoNT-A is guided through an anatomical landmark or pain location. However, there is risk for injection without ultrasound-guidance such as fat pad disturbance. So, we plan to proceed the Intra-articular injection of BoNT-A through the ultrasound-guided method for refractory knee osteoarthritis of older individuals and study changes of the knee joint before and after intervention via MRI and radiograph imaging, and provide the new choice for refractory knee osteoarthritis of older individuals.

Methods: Sixty patients with refractory knee osteoarthritis were randomly divided into three groups (A:saline, B: BoNT-A, C: sodium hyaluronate). Evaluation of WOMAC (Western Ontario and McMaster Universities Osteoarthritis Index) questionnaire score, VAS ((Visual Analogue Scale) score and SF-36 ((the MOS item short from health survey) at baseline, 4 weeks and 8 weeks follow-up were recorded respectively.

Results: WOMAC, VAS and SF-36 were improved in group B and group C patients compared baseline to 4 weeks and 8 weeks respectively ($P < 0.05$). Significant differences in improvement for WOMAC and VAS in group B vs group A and group B vs group C at 4 weeks and 8 weeks ($P < 0.05$). However, no changes in WOMAC, VAS and SF-36 were observed for the group A.

Conclusions: The treatments of Botulinum toxin type A were beneficial and safe for patients suffering from refractory knee OA.

Sponsor: N/A
IRB/IACUC#: 2015CX/K025 (Yue Bei People's Hospital, China)

2202 - Poster **Classification:** TCOM DO Student

Presenter: Brian M. Dena **Department:** Non UNTHSC

Authors: Brian Dena M.S., UNT Health Science Center; Tariq Al-Farra M.S., UNT Health Science Center; Patricia Gwirtz Ph.D., UNT Health Science Center

Bladder Management of Traumatic Spinal Cord Injury in the Acute Trauma Setting

Purpose: Neurogenic bladder is a common complication of spinal cord Injury (SCI). This condition increases the risk of urinary tract infection, bladder stones, urinary incontinence, and renal failure. Immediately following SCI, patients are often medically stabilized with an indwelling catheter (IC) in place. If possible, efforts are made to transition from IC to Clean Intermittent Catheterization (CIC), which has been shown to have less risk of complications. Currently, no protocol exists for transition from IC to CIC due to research gaps in spinal cord injury rehabilitation. The purpose of this project is to describe the bladder management of newly diagnosed SCI patients in the acute trauma setting and to analyze factors related to their demographics, injury, and hospital course.

Methods: Electronic medical records of patients admitted to Baylor University Medical Center (BUMC) followed by inpatient rehabilitation at Baylor Institute for Rehabilitation (BIR) in Dallas, TX were reviewed. A total of 59 patients met the following criteria: initial presentation and management of SCI at BUMC, immediate inpatient rehabilitation at BIR, traumatic SCI AIS A-E.

Results: The age at time of injury was between 16-88 years of age with a mean of 45 (s.d. ± 22.5). The average length of stay at BUMC was between 4 to 66 days with a mean of 20 (s.d. ± 16.5). The most common mechanisms of injury were fall in 27 patients (45%), gun shot wound in 16 patients (27%), and motor vehicle collision in 10 patients (17%). A total of 54 patients (92%) had an IC placed at admission to BUMC. Bladder management at BUMC discharge was as follows: IC 24 (41%), CIC 16 (27%), and volitional voiding 19 (32%). Of the 54 patients, 24 patients (44%) had the IC removed before discharge, while 30 (56%) were discharged and admitted to BIR with IC. An IC was in place between 0 and 39 days with a mean of 9 (s.d. ± 9.6). Urinary tract infection (UTI) developed in 11 (19%) patients at BUMC.

Conclusions: Over ninety percent of patients had an IC placed immediately following SCI. Of the patients that could not tolerate volitional voiding, 40% achieved the optimal method of CIC by the time of discharge from BUMC. This study describes the current clinical management of the bladder in SCI, and demonstrates that UTI was observed in 19% of patients. Further research is warranted to analyze additional factors related to complications from neurogenic bladder in SCI rehabilitation.

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Psychology (Abstracts in the 2300s)

2300 - Poster **Classification:** School of Health Professions Student
Presenter: Madeleine Courvoisier **Department:** Physician Assistant Studies
Authors: Madeleine Courvoisier, UNT Health Science Center; Amy Wier, UNT Health Science Center; Michelle Hagen, UNT Health Science Center; Grace C. Lorenz, UNT Health Science Center; Jessica L. Hartos, UNT Health Science Center

Is Alcohol Use Related to Depression in Young Adult Males?

Introduction: Depression and alcohol use have been linked in previous research, but these studies did not focus on a specific population or gender. The purpose of this study was to assess the relationship between depression and alcohol use in young adult males.

Methods: This cross-sectional analysis used 2014 BRFSS data for young adult males ages 18-44 from Oregon, Maine, Oklahoma, and West Virginia. Multiple logistic regression analysis assessed the relationship between depression and alcohol use while controlling for age, marital status, employment status, income level, weight status, sleep, and tobacco use.

Results: Few young adult male participants reported ever being diagnosed with depression (15-19%) and the majority reported alcohol use in the last 30 days (52-69%). After controlling for social behaviors and demographic factors, depression was not significantly related to alcohol use in any of the four states. However, depression was inversely related to employment status (moderate effect sizes) and income level (large effect sizes) in two out of four and three out of four states, respectively.

Conclusions: Overall, alcohol use was not related to depression in general population samples of young adult males. Income level was significantly related to depression in three states and employment status in two states. However, this study was cross-sectional, therefore, provided no history about the participants' previous use of alcohol or experience with depression over time. Although an association was not determined between depression and alcohol use, it is recommended that primary care practitioners assess for alcohol use in young adult males due to the high prevalence in this population and assess for depression only if there are associated symptoms.

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2301 - Poster **Classification:** SPH Student

Presenter: Fanni Mandy **Department:** Texas College of Osteopathic Medicine
Authors: Fanni Mandy BS, UNT Health Science Center; Susan Franks BS, UNT Health Science Center; Cindy Tiu BS, UNT Health Science Center; Michelle Lee MS, UNT Health Science Center; Kimberly Fulda DrPH, UNT Health Science Center

Cognitive Bias to Unhealthy Food is Related to Coping and Family History of Anxiety in Adults

Purpose: Stress has shown an influence on food intake, especially for women who are emotional eaters under stressful conditions and use eating as a coping mechanism. Recent studies have aimed to determine the role of cognitive bias (CB) as a neurocognitive process of selective attention to unhealthy foods. However, food-related CB is not yet well-characterized. Thus, the purpose of this study was to explore relationships between stress (STR), emotional eating (EE), coping (COP), anxiety (ANX), and CB toward unhealthy foods. Additionally, it was hypothesized that CB would differ between men and women and between normal-weight and overweight subjects.

Methods: Participants included adult men and women (n = 59) with an average age of 31.38 years (sd = 12.24) and an average BMI of 24.60 kg/m^2 (sd = 5.44). Self-report surveys included demographics, the State-Trait Anxiety Inventory to measure state ANX, and the Eating and Appraisal Due to Emotions and Stress to measure STR, EE, and COP. A computerized Stroop Task measured response time (RT) to healthy and unhealthy food words as compared to neutral words. CB scores to unhealthy foods were calculated (unhealthy RT–healthy RT), and subjects were categorized into higher or lower CB based on the direction of CB from zero. CB across weight class, gender, and family histories (FH) of obesity and anxiety were analyzed using chi-square tests. EE, STR, COP, and ANX were analyzed between high and low CB with Mann-Whitney U and t-tests.

Results: A higher CB to unhealthy food cues was greater among subjects without a FH of anxiety (n = 21, 58.3%) as compared to subjects with a FH of anxiety (n = 7, 33.3%). This difference approached significance (p = .069). COP was significantly lower for a higher CB to unhealthy food cues (mean = 79.68) as compared to a lower CB (mean = 83.97), (p = .031). Other comparisons were non-significant.

Conclusions: An inadequate ability to cope with stress may promote a propensity to selectively attend to unhealthy foods. A family history of anxiety may be a moderating factor for developing cognitive bias toward unhealthy foods. This study reiterates the multi-factorial complexity of cognitive bias to food cues and reinforces the need for additional research.

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2302 - Poster **Classification:** Resident

Presenter: Alexandra M. Santiago **Department:** Family Medicine

Authors: Alexandra Santiago DO, Plaza Medical Center; Kimberly Fulda, UNT Health Science Center; Susan Franks PhD, UNT Health Science Center; Michael D. Shaffer DO, UNT Health Science Center; Shane I. Fernando PhD MS, UNT Health Science Center

Factors Associated with Depressive Symptoms in Mexican American Adolescents

Background: Depressive symptoms have been linked to health, obesogenic behaviors, and family functioning; however, previous research has been inconsistent. This study aims to investigate associations between depressive symptoms and several aspects of health, health behavior, and family relationships in a high risk, Mexican American adolescent population.

Hypothesis: We hypothesized obesity, poor overall heath, decreased physical activity, and distant family relationships would be associated with above average depressive symptoms reported by child and caretaker.

Methods: 144 Mexican American children aged 10-14 years were enrolled with a legal guardian. The Children's Depression Inventory (parent and child versions) were used to determine clinically elevated depressive symptoms. Physical activity was reported by the parent and defined as days exercised > 20 minutes in the past week. Parents rated child overall health from poor to excellent and family relationship from very distant to very warm/close. Obesity was defined as a BMI ≥95th percentile. Simple and multiple logistic regressions were performed with depressive symptoms (parent and child report) as the outcome and BMI percentile, physical activity, overall health, and family relationship as primary predictors. The adjusted model controlled for child's age and gender.

Results: The mean age was 11.96 (SD=1.45) with 49% female. Twenty-five (17.4%) screened high for depression by parent report, and 30 (20.8%) screened high for depression by child report. If the parent reported the child's health as fair/poor (compared to very good/excellent), there was an increased odds that the parent [OR=12.89: 95%CI(2.22-74.86)] and child [OR=11.82: 95%CI(2.44-57.15)] reported elevated depressive symptoms. If the parent reported "don't know" for physical activity (compared to 4-7 days), there was an increased odds of having parent reported elevated depressive symptoms [(OR=4.38: 95%CI(1.001-19.182)].

Conclusions: The association between poor reported overall health and increased depressive symptoms on both child/parent CDI suggests clinicians should ask adolescent caretakers to rank the child's overall health. Below average answers may indicate the need for further depression screening. The association between parent answer of "don't know" for physical activity and elevated depressive symptoms suggests a lack of parental involvement may also be a risk factor for depression.

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2303 - Poster **Classification:** TCOM DO Student

Presenter: Cindy Tiu **Department:** Texas College of Osteopathic Medicine

Authors: Cindy Tiu BS, UNT Health Science Center; Susan Franks BS, UNT Health Science Center; Fanni Mandy BS, UNT Health Science Center; Michelle Lee MS, UNT Health Science Center; Kimberly Fulda DrPH, UNT Health Science Center

Personal, Psychological, and Family History Risk Factors for Emotional Eating Related to Obesity

Background: The concept that emotion strongly influences eating, referred to as "emotional eating" (EE), recently gained considerable interest in research. Previous evidence suggested that overeating by overweight individuals reduces anxiety and drives hyperphagia leading to obesity. The obesity literature indicated EE significantly differentiates obese from normal weight women. However, little is known about what other factors may contribute to EE. This exploratory study aims to better understand personal, psychological, and family history factors that might be associated with EE. Factors explored included gender, weight class, coping (COP), anxiety (ANX), stress (STR), and family histories (FH) of obesity and anxiety.

Methods: Participants included adult men and women (n=59) with an average age of 31.38 years (sd=12.24) and an average BMI of 24.60 kg/m^2 (sd=5.44). Self-report surveys included demographics, the State-Trait Anxiety Inventory to measure state ANX and the Eating and Appraisal Due to Emotions and Stress to measure STR, EE, and COP. Subjects were categorized into high and low EE based on standard error distance from the median. Chi square analyses were used to compare high and low EE with gender, weight class, FH of obesity, and FH of anxiety. T-tests were used to analyze differences between high and low EE for COP and STR.

Results: EE was greater among women (n=14, 70.0%) than men (n=3, 21.4%), p=005. EE was greater with a FH of obesity (n=7, 77.8%) as compared to subjects without a FH (n=9, 37.5%), (p=.039). EE was greater among subjects with a FH of anxiety (n=10, 71.4%) as compared to subjects without a FH (n=7, 36.8%), p=.049. Coping was lower for subjects with higher EE (mean=80.00) as compared to subjects with lower EE (mean=84.94), p=.050. Anxiety was higher for subjects with higher EE (mean=36.13) as compared to subjects with lower EE (mean=29.06), p=.027. There were no differences in EE for weight class or recent stress.

Conclusions: Women appear to be more at risk for EE than men. EE is also more likely with higher anxiety and poor coping skills. Additionally a FH of obesity or anxiety appears to put individuals at risk for EE. Clinicians should be aware of the factors related to EE in order to identify patients who are at risk and provide targeted interventions in order to prevent obesity and promote weight loss.

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Rehabilitative Sciences (Abstracts in the 2400s)

2400 - Poster **Classification:** School of Health Professions Student
Presenter: Tyler Caldwell-Webster **Department:** Physical Therapy Program
Authors: Tyler Caldwell-Webster, UNT Health Science Center; Courtney Cramer, UNT Health Science Center; Caitlin Cramer, UNT Health Science Center; Clayton Holmes, UNT Health Science Center; Yasser Salem, UNT Health Science Center; Howe Liu, UNT Health Science Center

Whole Body Vibration Therapy for Patients with Multiple Sclerosis – A Review

Background and Purpose: Whole body vibration (WBV) therapy has been used more frequently for patients with multiple sclerosis (MS) in last 10 years, but the results seem to be inconsistent. The purpose of this review is to analyze how different variables including intervention parameters and outcome assessment instruments might affect the results of WBV therapy on patients with MS.

Methods: PubMed and Scopus were used for searching literature published in English from 1996 - 2016. Key words were: whole body vibration (WBV), vibrotherapy, and multiple sclerosis. Included articles had to be prospective longitudinal studies.

Results: Fourteen studies were qualified including 12 randomized control trials and 2 single-group studies. The studies found that, regardless of standing statically (without moving at all - 11 studies) or dynamically (feet stable with trunk and arms incorporated in exercise – 3 studies) on the vibration platform, younger aged patients (yrs) and/or less disabled patients (as measured with Expandable Disability Status Scale – EDSS < 4.5) showed more consistent improvements and better outcomes than regular therapy in strength, balance, and mobility. Older aged patients (>45 yrs) and more disabled patients (EDSS > 5.0) showed no difference from regular exercises.

For WBV the most frequent intervention parameters were 3/week (7/11 articles, ranged 1- 5/week) for frequency, 3 weeks or 8 weeks (3/13 articles, respectively, ranged from 1 - 20 weeks) for duration, and 5 min per session (6/10 articles, ranged from 5 – 10 minutes as a single intervention, or from 30-50 minutes as part of a combined study). These parameters demonstrated inconsistent results.

Of the vibration parameters mentioned in 7 studies, 1-3 mm in amplitude with on-off time ratios at 1:1 (45 sec on: 45 sec off) and frequency from 2 - 50 Hz were identified. It revealed that different frequencies of vibration created inconsistent results in terms of patient's balance, mobility, and endurance. However, muscle strength was consistently improved in high frequency (>11Hz), but not in lower frequency (Hz).

Conclusions: Younger aged patients (yrs) and/or patients with low EDSS score (< 4.5) may show improvement with WBV. Intervention parameters (3/week, 5-10 minutes per session, 1:1 ratio for on-off time with 1-3 mm as vibration amplitude for 3 – 8 weeks) are often chosen by clinicians. Mobility, balance, endurance, and strength are the most commonly assessed functional outcomes.

Sponsor: N/A
IRB/IACUC#: N/A

2401 - Poster **Classification:** TCOM DO Student
Presenter: Chia-Ye Chu **Department:** Texas College of Osteopathic Medicine
Authors: Chia-Ye Chu, UNT Health Science Center; Rita Patterson, UNT Health Science Center

Soft Robotic Devices for Hand Rehabilitation: A Narrative Review

Objective: The debilitating effects on hand function from a number of a neurologic disorders has given rise to the development of rehabilitative robotic devices aimed at restoring hand function in these patients. To combat the shortcomings of previous traditional robotics, soft robotics are rapidly emerging as an alternative due to their inherent safety, less complex designs, and increased potential for portability and efficacy. While several groups have begun designing devices, there are few devices that have progressed enough to provide clinical evidence of their design's therapeutic abilities. Therefore, a global review of devices that have been previously attempted could facilitate the development of new and improved devices in the next step towards obtaining clinical proof of the rehabilitative effects of soft robotics in hand dysfunction.

Methods: A literature search was performed in SportDiscus, Pubmed, Scopus, and Web of Science for articles related to the design of soft robotic devices for hand rehabilitation. A framework of the key design elements of the devices was developed to ease the comparison of the various approaches to building them. This framework includes an analysis of the trends in portability, safety features, feedback augmentation, actuation systems, active DOF, device weight, evaluation metrics, and modes of rehabilitation.

Results: In this study, a total of twenty-seven articles representing twenty unique devices were identified and summarized according to the framework we developed to compare different design aspects. By far, the most common type of device was a Flexion Pneumatic System (80%). However, the remainder of our framework elements yielded more heterogeneous results. Consequently, those results are summarized and the advantages and disadvantages of many design choices as well as their rationales were highlighted.

Conclusions: The past three years has seen a rapid increase in the development of soft robotic devices for hand rehabilitative applications. These mostly preclinical research prototypes display a wide range of technical solutions which have been highlighted in the framework developed in this analysis. More work needs to be done in actuator design, safety, and implementation in order for these devices to progress to clinical trials. It is our goal that this review will guide future developers through the various design considerations in order to develop better devices for patients with hand impairments.

Sponsor: N/A
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2402 - Poster **Classification:** School of Health Professions Student
Presenter: Natalie Jay **Department:** Physical Therapy Program
Authors: April Downing, UNT Health Science Center; Natalie Jay, UNT Health Science Center; Rachael Cook, UNT Health Science Center; Howe Liu, UNT Health Science Center; Yasser Salem, UNT Health Science Center

Effects of Aerobic Exercise for Children with Down Syndrome: A Systematic Review of Literature

Purpose: The purpose of this study is to examine evidence regarding the potential benefits of aerobic exercise for children with DS. Safety, benefits, and application are addressed.

Methods: This systematic review identified thirteen articles that met our inclusion criteria. Electronic databases used were PubMed, PEDro, CINAHL, and Scopus. Key words included Down syndrome, trisomy 21, aerobic, aerobic capacity, cardiovascular, cycling, fitness, exercise, endurance, running, and swimming. Our initial search yielded 154 potential articles, which we screened for selection criteria. In total, 464 children with DS were studied in our thirteen final research articles.

Results: A total of thirteen articles were examined and met our inclusion criteria for aerobic exercise in children with DS. Of the included articles, eleven were randomized controlled trials, one was a quasi-experimental design, and one was a cohort study. Across all 13 studies, 464 children with DS were participants. The sample size for each study ranged between 16 and 92 children. All of the studies showed a significant improvement in one or more positive outcome, including bone mineral density, body composition, pulmonary function, lower extremity muscle strength, joint kinematics, reaction time, and balance. None of the studies reported any adverse events or changes in health status during their interventions. Only two of our included studies (15%) included follow up.

Conclusions: This systematic review adds to the body of literature that supports aerobic exercise for children with DS. Studies included support the beneficial effects of aerobic exercises for children with DS. Further studies are needed to determine long term effects of any intervention. Available literature on aerobic exercise in children with DS suggests that there are beneficial effects without adverse outcomes, which means it is a reasonable treatment option for children with DS.

Sponsor: N/A
IRB/IACUC#: N/A

2403 - Poster **Classification:** TCOM DO Student

Presenter: En-Szu Liao **Department:** Physical Therapy

Authors: Ali Ersen, UNT Health Science Center; En-Szu Liao, UNT Health Science Center; Veronica Foster, UNT Health Science Center; Christopher Hankins, UNT Health Science Center; Sloane Martin, UNT Health Science Center; Linda S. Adams, UNT Health Science Center; Mike Richardson, UNT Health Science Center; Metin Yavuz, UNT Health Science Center

A Novel Cooling Wheelchair Design as a Proof-Of-Concept Study

Background: For many wheelchair users, the combination of reduced mobility and impaired sensation, including but not limited to neurological insults, vascular issues, decreased cognition, and morbid obesity, results in a life-time risk of pressure ulcer development. Pressure ulcers are a type of wound that results from a breakdown of tissue over bony prominences due to localized ischemia caused by constant pressure. The compromised blood circulation along with reduced airflow results in an accumulation of heat in the tissue over the bony prominence which accelerates the tissue breakdown. In recent years, wheelchair cushions employed thick foam type materials, which provided a higher quality of pressure distribution but poorer heat dissipation.

Purpose: In this study, we designed a custom-built cushion that circulated chilled water. We measured buttocks surface temperatures and peak pressures around the ischial tuberosity, with a targeted maximum temperature and pressure of 28°C and 60mmHg, respectively.

Methods: In this ongoing study, we recruited one subject so far. The subject was asked to sit and actively propel the wheelchair with the aforementioned cushion for 30 minutes. Thermal images of the participant's buttocks were collected before and after wheelchair use and temperatures were collected in 10 minute intervals while seated, using thermocouples (K-type). Pressure distribution was captured at the end of the wheelchair use using a Tekscan ConforMat, which was placed on top of the cooling cushion. All study procedures were approved by the institutional review board (IRB) prior to recruitment and testing, and informed consent was obtained from subjects prior to testing.

Results: The results indicated that the cooling wheelchair cushion was capable of cooling the tissue from 28.1°C to 24.9°C. The chilled water temperature ranged from 21.5-21.8°C during wheelchair use. Peak pressure occurred at the right ischial tuberosity and was quantified as 115mmHg.

Conclusions: The custom-built cooling wheelchair cushion maintained temperatures of the buttocks below 28°C but failed to lower the peak pressure to below 60 mmHg. Further modification and testing of the cushion design are warranted to achieve the pressure reduction goal. Another improvement will be adding a closed-loop control system to prevent overcooling of the tissue.

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2404 - Poster **Classification:** School of Health Professions Student

Presenter: Jordan Fox **Department:** Physical Therapy

Authors: Jordan Fox, UNT Health Science Center; Victoria Kowalewski, UNT Health Science Center; Linda Thibodeau PhD, University of Texas at Dallas; Rita Patterson PhD, UNT Health Science Center; Nicoleta Bugnariu PT, PhD, UNT Health Science Center

The Impact of Hearing Loss on Older Adult's Postural Control and Gait Function

Purpose: We investigated the relationship between hearing loss and postural control and balance in older adults using a dual task paradigm in a realistic virtual environment. We also evaluated the effect of two types of Hearing Aid (HA) technologies on measures of balance and gait. We used a regular HA that amplifies sound from all directions and frequencies and a Frequency Modulator (FM) system designed to work in conjunction with the regular HA and to selectively amplifies only one frequency of interest and not the ambient noise.

Materials/Methods: 12 adults newly diagnosed with hearing loss, without vestibular or other neurologic impairment; 12 age- and gender- matched healthy controls. Participants were tested for balance, gait and functional activities, at the time of hearing loss diagnosis and enrollment in the study and after two months accommodation to a hearing aid. Outcome measures included: standing center of pressure sway during quiet standing, performance of dual task involving balance + auditory standardize testing, and self- selected gait speed on flat and uneven terrain in the virtual environment. Testing conditions were: No HA, HA, Ha + FM; auditory task conditions either listening only or repeating back sentences form standard audiology tests. Clinical tests of DGI, TUG, ABC Scale and Short Physical Performance Battery were also administered. ANOVA was conducted for each of the dependent variables with respect to group, condition of HA, and condition of auditory task.

Results: Center of pressure sway variability in both A/P and M/L direction was increased ($p<.05$) in participants with hearing loss vs. controls when subjects had to perform a dual postural and auditory task. In individual with hearing loss self- selected gait speed was lower ($p<.05$) compared to controls, when they attended to the auditory task of repeating back sentences without hearing aids. Use of HA+FM significantly improved ($p<.01$) performance on auditory repeating back sentences task but also increased self-selected speed. Clinical measures showed no difference between groups.

Conclusions: Hearing loss negatively impacts postural control particularly in dual-task conditions when individuals attend to both auditory and postural tasks. Use of hearing aids, especially the FM system, significantly improves not only speech recognition but also measures of balance and gait, and ability to successfully perform dual tasks.

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IRB/IACUC#: 2012-114

2405 - Poster **Classification:** School of Health Professions Student
Presenter: Kaitlyn Green **Department:** UNT Health Physical Therapy
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Atypical Eye Movements and Postural Control in Autism Spectrum Disorders

Hypothesis: Research shows a link between pursuit eye movements, visual processing, and postural control; current evidence suggests these links are different in individuals with Autism Spectrum Disorder (ASD). For those with ASD, few studies quantitatively examine visuomotor integration and its influence on postural stability. The purpose of this study was to observe individuals with ASD and those with typical development (TD) in order to identify and characterize differences in how visual information and eye movement are used for postural control.

Materials/Methods: This study was conducted in community sites in the Dallas-Fort Worth metroplex. Five adolescents with ASD and 5 age matched TD controls completed the study. The experiment consisted of balance testing, including the Limits of Stability (LOS) and The Clinical Test for Sensory Integration (CTSIB), on a force plate while wearing the ETG 2.0 eye tracking system. The CTSIB requires quiet standing with eyes open, eyes closed, and wearing a translucent dome. The LOS requires a shift in center of pressure (CoP) to reach 9 target positions displayed on the screen. Data were analyzed with t-tests.

Results: ASD adolescents had higher sway and stability indices than TD across all conditions of the CTSIB. During LOS testing the ASD group had lower postural control than the TD group in 5 of the 9 target positions. Overall, ASD group took a longer time to complete the task, which is a proxy for movement accuracy, since the task advances when participants meet “hit” criteria for each target. Pursuit eye movements and stabilization of targets showed greater variability in ASD group compared to TD. Moreover, the ASD participants did not improve their performance across the 3 trails of the LOS.

Conclusions: These preliminary data support our hypothesis that individuals with ASD would have greater postural instability than TD controls. These impairments may be linked to increased variability and less accuracy of pursuit eye movements. When visual context was eliminated, individuals with ASD demonstrated markedly greater impairment in stability. When LOS were tested, the ASD group showed greater difficulty maintaining postural control during CoP shift. Preliminary eye movement data suggests that atypical gaze patterns relate to impairments in stability. Further studies are necessary to investigate this atypical visiomotor integration and its possible role as a fundamental feature of ASD.

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IRB/IACUC#: 2015-010

2406 - Poster **Classification:** School of Health Professions Student
Presenter: Hillary Hummel-Kerbs **Department:** Physical Therapy
Authors: Hillary Hummel-Kerbs, UNT Health Science Center; Evan Papa, UNT Health Science Center; Xiaoyang Dong, UNT Health Science Center; Mahdi Hassan, UNT Health Science Center

Resistance Training for Activity Limitations in Older Adults with Skeletal Muscle Function Deficits: A Systematic Review

Objective: Resistance training (RT) is defined as any strength training program in which participants exercise a muscle against an external force that is set to a specific intensity. RT is a critical component of rehabilitation programs for preserving functional activity in older adults. Skeletal muscle function deficits, such as sarcopenia, can be improved with RT. The purpose of this systematic review was to provide an overview of the current knowledge on RT for older adults with sarcopenia and offer recommendations for clinical practice to improve functional mobility for patients.

Methods: This study was conducted according to the Methodology to Develop Systematic Reviews of Treatment Interventions developed by the American Academy for Cerebral Palsy and Developmental Medicine. A search was performed in PubMed with the following inclusion criteria: average age 60+, RT as the only intervention, and functional mobility as the primary outcome measure. Exclusion criteria included absence of supplementary training measures, absence of chronic neurological conditions, any article that was published prior to 2008. Articles were limited to publications in the English language. Articles were summarized and effect sizes were calculated using Cohen's d for each intervention.

Results: Eleven articles were included in this systematic review. There was a general consensus that one-hour training sessions on alternate days of the week, 2-3 times per week was enough time to make significant improvements in function. The articles with the highest effect sizes were an average of 10.5 weeks; the shortest being 6 weeks and longest being 13 weeks. Two studies examined core strengthening which showed an average effect size of 1.13 on the Functional Reach Test (FRT). Seven studies focused on the strengthening the large muscle groups in the lower extremities. These articles described notable effect sizes in functional outcomes such as eyes closed single leg balance (0.81), Timed Up and Go (1.45), 10-meter walk test (0.85), timed chair rise (2.42), FRT (5.28), and maximal lateral lean (0.88).

Conclusions: Resistance training can attenuate age-related changes in muscle function. To improve functional outcomes in older adults with sarcopenia we recommend a 60-minute RT exercise program to be performed 2-3 times per week. RT sessions should be dosed at 2-3 sets of 8-12 reps, with a 2-minute rest between sets.

Sponsor: N/A
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2407 - Poster **Classification:** School of Health Professions Student
Presenter: Trey Jeffers **Department:** Physical Therapy
Authors: Trey Jeffers, UNT Health Science Center; Ryan Wigley, UNT Health Science Center; Evan Papa, UNT Health Science Center

Effects of Muscle Fatigue on Postural Control in Neurologically-Impaired Populations

Purpose: Research has shown that acute muscle fatigue alters postural control in neurologically healthy young and older individuals, but there is little research on the effects of muscle fatigue on neurologically impaired individuals. The purpose of this literature review was to examine the effects of short-term muscle fatigue on postural control as it relates to neurologically impaired populations. We hypothesized that muscle fatigue would cause declines in postural control in persons with neurological impairment such as stroke, Parkinson's disease (PD), and Cerebral palsy.

Subjects: N/A

Methods: A literature review using the key words "muscle fatigue" and "postural control" was performed in PubMed and PTNow. Twenty titles and abstracts were reviewed in order to exclude subjects without neurologic disease. After checking the available abstracts four full text articles were evaluated.

Data Analysis: N/A

Results: 4 articles were included aimed at the effects of muscle fatigue on postural control in neurologically-impaired persons. Individuals with stroke showed a statistically significant decline in maximum walking speed (pre = 0.97±0.5 m/s; post = 0.71±.4 m/s, $P < 0.05$) after 6-minute bout of walking, while control subjects did not decline (pre = 1.85±0.2 m/s; post 1.80±0.2 m/s). Also, decreases in hip flexion velocity (8°/s) and hip range of motion after the walking exercise (pre-fatigue > post fatigue measurement, time effect, $P < 0.05$). (Rybar, MM. et al., 2014). In a similar study, individuals with stroke were fatigued using isometric hip flexion contraction. Paretic leg coefficient of variation (CV) was negatively correlated with comfortable walking speed ($p < 0.05$) indicating that slower walkers had greater fluctuations in motor output. In addition, there was an inverse relationship between the paretic leg mean CV and the Berg Balance Test score ($p < 0.05$) (Hyngstrom, AS. et al., 2012). In children with Cerebral Palsy, postural control deteriorated after walking on a pathway as shown by the significant increase in the path length of the center of pressure (COP) and the COP range in the anterior-posterior axis ($P<0.05$). The COP range and velocity in the medial-lateral axis also tended to be larger after fatigue ($P< 0.08$) (Hart, R, et al., 2014). Persons with PD were fatigued using eccentric muscle contractions of the quadriceps and hip extensors. Increases in ankle angular displacement in the support/landing limb during reproducible falls were found after fatiguing exercise ($p=.02$).

Conclusions: The results of this study indicate that persons with neurological impairments are negatively affected by muscle fatigue. Similar effects have been found in neurologically healthy adults. Individuals with stroke showed declines in maximum walking speeds and hip flexion velocity and range of motion compared to their healthy counterparts after fatiguing exercise. There was a correlation between walking speed and paretic leg variability; slower walkers had greater fluctuations in motor output. Children with Cerebral palsy displayed a deterioration in postural control after fatigue, demonstrated by

the increase in path length and range of the COP. Muscle fatigue had a minor effect on lower extremity joint kinematics in persons with PD.

Clinical Relevance: Acute bouts of muscle fatigue have negative consequences on gait and postural control in individuals with neurologic disease. Physical therapists should be aware of the potential for decreased postural control following acute bouts of intense exercise in clinical care settings.

Sponsor: N/A
IRB/IACUC#: N/A

2408 - Poster **Classification:** TCOM DO Student

Presenter: Nicolas Jordan **Department:** Texas College of Osteopathic Medicine
Authors: Nicolas Jordan, UNT Health Science Center; Rita Patterson, UNT Health Science Center

Rehabilitation of Hand Impairment in Children With Spastic Cerebral Palsy: A Narrative Review

Purpose: A broad range of rehabilitative therapies are currently being used and/or researched to improve functionality and prevent complications in hand impairments due to spastic cerebral palsy in children. However, outcomes are highly variable and no ideal rehabilitation strategy exists. The purpose of this research was to identify the current state of non-surgical therapies for spastic cerebral palsy in children, and to offer recommendations for the development of new treatment modalities.

Methods: Articles were identified through searches of Pubmed and Scopus. Medical Subject Headings (MeSH) terms and key words were used as follows: (1) cerebral palsy, AND (2) child OR adolescent, AND (3) hand, AND (4) therapy OR rehab*, AND (5) randomized controlled trial OR random sampling OR double blind method OR single blind method OR systematic review.

Results: In this study, a total of forty-one articles representing six approaches to therapy were reviewed. The approaches were traditional occupational therapy, hand-arm bimanual intensive therapy (HABIT), constraint-induced movement therapy (CIMT), botulinum toxin injections, mirror visual feedback, and robotic assisted motion. Additionally, this review identified key factors of therapy that are relevant to patient outcomes, including the age of the patient, intensity of therapy, and compliance of at-home training.

Conclusions: Traditional therapy relies heavily on the frequency, duration, and consistency of the therapy. Thus, patient ability to attend sessions can limit the effect of therapy. HABIT, CIMT, and mirror visual feedback are effective approaches, but they are only applicable to unilateral impairments. Patients given Botulinum toxin injections show significant improvement, but injections every three to six months are a costly addition to therapy. Soft robotic rehabilitation is a promising extension of therapy; specifically, it could target the critical developmental window and fill the need for an easy-to-use device to improve at-home training compliance and intensity. Additionally, soft robotic rehabilitation would be applicable to a wide variety of clinical presentations. Regarding development of soft robotic devices, comfort and ease of use are of the upmost importance to encourage compliance. Additional considerations must be made for the target population; for example, the device must accommodate growth spurts and skeletal maturation.

Sponsor: TCOM Honors Research Practicum
IRB/IACUC#: N/A

2409 - Poster **Classification:** School of Health Professions Student
Presenter: Brenda L Kinzler **Department:** Physical Therapy Program
Authors: Brenda Kinzler, UNT Health Science Center; Nicoleta Bugnariu, UNT Health Science Center

A Matter of Balance Service Learning Activities Positively Impact both Physical Therapy Students and Seniors Confidence

Purpose/Hypothesis: The purposes of this study were to investigate the impact of Service Learning (SL) activities consisting of A Matter of Balance (AMOB) classes on: 1) physical therapy (PT) students' self-perceived confidence in working with older adults and 2) seniors' attitude towards fear of falling. We hypothesized PT students will have an increase in confidence working with seniors after participating in SL activities. Secondly, we hypothesize seniors who participate in the fall prevention course will have a decreased fear of falling as well as an increase in physical activity levels.

Materials/Methods: The PT department established a collaborative relationship with Senior Citizen Services (SCS), an organization which identified a community need for senior education regarding fall risk reduction. The SL activities consisted of 86 PT students from two consecutive cohorts of a first-year geriatrics course: 1) attending an 8-hour training class in AMOB: A Fall Prevention Course and 2) leading 8 classes of AMOB workshops at senior community centers in Tarrant County, TX. PT students completed a 25-question questionnaire rating self-perceived levels of competence at pre-training, post-training and post workshops. 490 older adults ranging from 62-96 years of age, whom voluntarily signed up for a fall prevention course through the Senior Citizens Service (SCS) completed a questionnaire addressing their fall concerns and fears; pre and post AMOB workshops. The questionnaires for the older adults were collected over the course of a two-year period by the SCS.

Results: Both student cohorts had similar confidence levels at the beginning of SL activities. All students reported increased confidence in essential competencies for assessing and mediating the risk for falls in older adults post AMOB trainings.

Conclusions: Integrating SL into a first-year geriatric course improved students' confidence and competence when working with the older adult population. PT students will apply this confidence in the clinical setting and will be prepared to effectively evaluate and treat the growing older adult population. Providing education regarding fall reduction may improve the safety and wellness for older adults, possibly leading to injury reduction and hospitalization.

Sponsor: N/A
IRB/IACUC#: 2013-168

2410 - Poster **Classification:** School of Health Professions Student
Presenter: Marie MacDonald **Department:** Physical Therapy Program
Authors: Marie MacDonald, UNT Health Science Center; Myla Quiben, UNT Health Science Center

Effectiveness of Sternal Precautions after Median Sternotomy: A Systematic Review

Purpose: The purpose of this systematic review is to analyze the current scope of literature on the effectiveness of sternal precautions or specific movement restrictions to reduce risk of sternal complications following a median sternotomy.

Methods: A systematic database search was completed using PubMed, MEDLINE Complete, PEDro, Scopus, and Cochrane. Each database was searched using the key words: “sternotomy”, “sternal precautions”, “sternal restrictions” AND “sternal stress”. Articles published in English between 2010 & 2014 based on the use of sternal precautions in patients’ after sternotomy as one of the primary interventions, experimental designs comparing the forces applied on the sternum, and systematic reviews were included. Articles were excluded if interventions did not include use of sternal precautions. Two articles where further identified through searching the studies cited in the current reviews. After duplicate articles were excluded, 7 articles were left for screening of the abstract for relevance on sternal precautions. Six articles satisfied the criteria for full text screening. One article was excluded due to lack of access to the full text.

Results: The current evidence suggests that significant variations in the use of sternal precautions or specific movement restrictions after a median sternotomy exist. There is no consensus on the clinical definition of these precautions causing wide variation in the application of sternal precautions. To date, paucity of evidence exists in supporting the use of restrictive sternal precautions.

Conclusions: The body of evidence on the use of sternal precautions is scarce. While the risk of complications and predictors of risk following a median sternotomy are thoroughly studied on a physiological level, the movement factors influencing recovery have little to no evidence. Further research is needed to investigate if these movement restrictions are necessary and if they influence outcomes, recovery, and quality of life. Clinicians must consider the patient’s unique characteristics including comorbidities, impairments, functional limitations, and prior level of activity when prescribing sternal precautions, rather than restricting functional and physical activities based on a protocol applied homogeneously to all patients after median sternotomy.

Sponsor: N/A
IRB/IACUC#: N/A

2411 - Poster **Classification:** School of Health Professions Student
Presenter: Matthew Pennucci **Department:** Physical Therapy
Authors: Matt Pennucci, UNT Health Science Center; Howe Liu, UNT Health Science Center; David Dillard, UNT Health Science Center; Stephen Baker, UNT Health Science Center

Comparison of Trunk and Leg Sway During Single Leg Stance

Purpose/Hypothesis: A force platform is a commonly used instrument to evaluate body sway. However, such a platform is not able to analyze how different body parts respond during static single-leg stance. The purpose of this study was to use a small wearable gyroscope-based balance assessment instrument, Balance Gear, to investigate how different body parts respond during static single-leg stance. We hypothesized that measurements at the knee would exhibit more sway than measurements taken at the lumbar level.

Materials and Methods: Nineteen (10 males and 9 females) healthy young graduate students from the principal investigator's institution were screened and recruited for this study. The Balance Gear (BG) was secured at two locations: L4 level (LUM), and popliteal fossa (KN) of the dominant leg. Testing location was randomized in order to avoid fatigue effect. Subjects were asked to perform static single-leg stance on the dominant leg for 30 seconds. Data of the subject's body sway (direction, range, velocity, and acceleration) were recorded and transmitted wirelessly to a computer for data storage and analysis. Paired t-tests were used for data processing.

Results: Subjects with the BG at KN showed a statistically significant difference in body sway range, velocity, and acceleration in the antero-posterior plane ($p<.05$), but no such difference was found in frontal or axial planes ($p>.05$). Also, both LUM and KN sway posteriorly, but KN showed significantly larger range, velocity and acceleration compared to sway at LUM (all $p<.05$). No other differences were identified.

Conclusions: It is the very first time the sway of different body parts were assessed during static single-leg stance. During stance, the KN is larger in range, velocity, and more posterior direction than the LUM sway.

Sponsor: N/A
IRB/IACUC#: 2016-77

Structural Anatomy (Abstracts in the 2500s)

2500 - Poster **Classification:** TCOM DO Student
Presenter: Love Patel **Department:** Orthopaedic Surgery
Authors: Love Patel, UNT Health Science Center; Hugo Sanchez, UNT Health Science Center, JPS Health Network; Shiv Patel, JPS Health Network; Addison Woods, UNT Health Science Center

Tibiofemoral Kinematic Motion Changes After "Pie crusting" of the Medial Collateral Ligament

Introduction: Varus knee deformity is an added complication to total knee replacements that surgeons have to address to achieve balanced ligamentous tension and decrease the need for revision surgeries. Most cases involve osteoarthritis of the knee in which the medial joint space is collapsed when compared to the lateral side. This deformity causes the medial collateral ligament (MCL) to shorten and tighten up in relation to the lateral collateral ligament (LCL) and results in outward bowing of the leg, or a varus knee deformity. The conventional correction method is to lengthen the ligament by standard osteotomy, which involves using a osteotome and releasing the distal attachment of the MCL progressively to eventually balance the joint and in unique cases shortening the LCL ligament. The focus of this study is to address an alternative way to lengthen the MCL to by "pie-crusting," which is to poke a fixed number of holes in the MCL and study the kinematic motion changes.

Methods: Nine cadaveric legs in total were prepped to a rig that allowed the quadriceps, biceps femoris and semimembranosus muscles to be put under weighted tension and permitted free range of motion. The knee was cycled through the rig three times for each experimental condition and a Polhemus tracking system was used to record changes in real time allowing bio-kinematic analysis of the motion and changes in gap length. Experimental conditions included: a no punctures made, control, and three stages of hole punctures in the MCL in increasing density patterns.

Results: Preliminary Data results still under investigation.

Discussion and Conclusions: We predict that creating micro cuts into the ligament would provide the necessary adjustments to achieve balanced ligamentous tension of the knee in a more controlled fashion vs the traditional osteotome method of lengthening. This technique could serve as a more precise and predictable way to achieve the ligamentous laxity desired in total knee replacements with various deformities.

Sponsor: N/A
IRB/IACUC#: N/A

2501 - Poster **Classification:** TCOM DO Student
Presenter: Brandon Schmeits **Department:** Texas College of Osteopathic Medicine
Authors: Brandon Schmeits, UNT Health Science Center; Cara Fisher, UNT Health Science Center

Anatomical Variation in a Case of Bifid Rib

Background: This study involved a detailed dissection of a case of bifid rib with a focus on the structural aspects of the neurovasculature and musculoskeletal features. This study serves to add to the knowledge of the anatomical aspects of a rare rib dysfunction. This case is especially rare due to the Caucasian race of the cadaver. In this case the bifurcation was located on the right fourth rib at the costochondral junction. As with all other reported cases of bifid rib both internal and external intercostal muscles were present in the bifid space and the intercostal space above the bifurcation was reduced. Arterial supply was from an anastomosis of a branch off the third right anterior intercostal artery and a branch directly from the right internal thoracic artery. Innervation to the muscle of the bifid space was from a branch of the third intercostal nerve that branched in the lateral thorax and proceeded to run anteriorly along the superior aspect of the fourth rib.

Conclusions: Bifid rib, along with other rib abnormalities are often asymptomatic but have shown an association with malignancy in childhood and other mesodermal developmental abnormalities. Knowledge of bifid rib is necessary when diagnosing chest wall and lung tumors as well as rib fractures due to the variability of the bifurcation.

Sponsor: N/A
IRB/IACUC#: N/A

Women's Health (Abstracts in the 2600s)

2600 - Poster **Classification:** SPH Student
Presenter: Kisa Gant **Department:** Behavioral & Community Health
Authors: Kisa Gant, UNT Health Science Center; Surendra Mandapati, UNT Health Science Center; Leilani Dodgen, UNT Health Science Center; Heather Kitzman-Ulrich PhD, UNT Health Science Center, Baylor Scott and White Health

The Relationship Between Food Tracking And Attendance in a Weight Management Intervention in African American Women

Background: Approximately eighty percent of African American are overweight or obese. Interventions show less weight loss and shorter periods of maintenance overtime compared to Caucasians. Current interventions with AA women show less weight loss overall, and lower maintenance over time compared to other populations. Literature has shown that food tracking is one of the most effective ways to aid in weight loss. However, this behavior is difficult to adopt and sustain. A recent study found that there was a 3% adherence to "actively" documenting their food intake. Barriers that have been identified are: the process is tedious, makes one feel guilty at times, and not being able to correctly identify what to enter when making home cooked meals. These barriers are suspected to influence program attendance among participants. The Better Me Within (BMW) program is a faith-enhanced Diabetes Prevention Program (DPP) for women in African American churches. This study examines food tracking patterns over time compared to attendance during a 16 week behavioral intervention.

Methods: African American women from 11 churches in Dallas/Fort Worth attended weekly classes over 16 weeks in the BMW program. Participants were asked to track dietary intake each week through paper food logs or online food tracking programs. Health coaches at each church collected food logs, weight and attendance during class and reported this information to research staff. Attendance rates and frequency of food tracking were calculated from research logs. Descriptive statistics, and independent t-tests were conducted to examine the relationship between attendance and frequency of food tracking.

Results: A total of 221 AA women were randomized to intervention or control (mean age=48.8+11.2; mean BMI=36.7+8.4; 52% technical or high school). The mean attendance was significantly higher among the group who submitted more than four or more food logs ($u = 14.14$, $SD = 1.77$) than the group who submitted less than four food logs ($u = 8.8$, $SD = 4.9$), $p < 0.0001$.

Conclusions: Participants who engaged in higher levels of food tracking attended nearly twice as many sessions as women who completed less tracking. Both behaviors, self-monitoring through food tracking, and program attendance, have been associated with better health outcomes such as reduced weight and associated chronic disease risk factors. Future studies should evaluate what factors influence these behaviors such as self-efficacy, motivation, or barriers.

Sponsor: N/A
IRB/IACUC#: 2011-164

2601 - Poster **Classification:** TCOM DO Student

Presenter: Erin Keck **Department:** Obstetrics and Gynecology

Authors: Erin Keck, UNT Health Science Center; Annie Guardado, UNT Health Science Center; Philip Dokpesi, UNT Health Science Center; Sulaimon Bakre, UNT Health Science Center; Martha J. Felini, UNT Health Science Center

Association of Trauma on Chronic, Infectious, and Reproductive-Related Disease Prevalence Among Women in Substance Abuse Treatment

Background: Previous literature demonstrates that individuals with co-occurring substance use disorders (SUDCs) often have comorbid conditions. Although SUDCs have been linked to higher use of medical management, there are few studies of the burden of disease types across and within high risk women in substance abuse treatment. The purpose of this cross-sectional study was to analyze the prevalence of chronic, infectious, and reproductive-related disease separately among women in substance abuse treatment and further explore whether prior trauma history was associated with disease prevalence.

Methods: As part of a larger cancer prevention project conducted in Dallas from 2012-2016, 1076 women in treatment at the largest substance abuse treatment center in North Texas received education regarding cancer prevention, and were offered a well woman cancer screening exam. Data collected from a self-administered questionnaire included demographics, medical health history, reproductive history, substance use history, and trauma experience (physical, sexual, verbal/emotional) within the last 6 months. Participants were from 119 counties across Texas, including border counties. Descriptive and stratified analyses were performed to determine disease prevalence by trauma history.

Results: Exposure to trauma was correlated with a higher prevalence of chronic disease ($p < 0.01$), and infectious disease ($p < 0.01$), but not adverse reproductive outcomes in aggregate ($p = 0.11$). The most prevalent chronic diseases reported were anemia, gastrointestinal disease (constipation, diarrhea), kidney problems, migraine headaches, and mental illness. The most prevalent infectious diseases reported were chlamydia, gonorrhea, hepatitis, HPV, trichomonas, and warts. Approximately one-third (36%) reported at least one preterm delivery, miscarriage, or abortion. Only miscarriages were more prevalent in the trauma affected population ($p = 0.01$).

Conclusions: Findings suggest comorbid disease and adverse reproductive outcomes are prevalent in this population. An exceptional window of opportunity exists to integrate preventive and preconception care interventions within treatment recovery centers, but the key challenge will be determining how it can be best delivered to women with significant trauma histories.

Sponsor: Cancer Prevention Research Institute of Texas
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2602 - Poster **Classification:** Resident

Presenter: Angalene Jackson **Department:** Obstetrics and Gynecology

Authors: Timothy Kremer MD, JPS Health Network; Christine Hoang MD, JPS Health Network; Angalene Jackson DO, JPS Health Network; Hayley M. Marshall DO, JPS Health Network

Faculty, Resident, and Nursing Attitudes Regarding Transitions of Care of Antepartum, Postpartum, and Gynecology Patients in the County Hospital Setting

Purpose: To evaluate attitudes about a transition of care system and identify opportunities to improve the safety and quality of care involving antepartum, postpartum, and gynecology patients.

Background: Handoffs and transitions of care have been a central part of patient safety goals at John Peter Smith Hospital. With twice daily shift changes for physician and nurses, the Department of Obstetrics and Gynecology introduced a new interdisciplinary team transition of care system. Initial anecdotal feedback suggested that the handoff process was suboptimal and communication efforts could be improved. A survey was developed to evaluate opinions about the process and identify areas for improvement.

Methods: An anonymous online survey was administered to physicians and nurses participating in the new handoff system. The results were analyzed to identify opportunities for improvement.

Results: Responses were analyzed from 21 members of the interdisciplinary team. 47% of the respondents found the transition of care system helpful. 55% felt their goals for handoffs were accomplished. All respondents reported importance in addressing updates on patient plans of care and anticipated discharge dates. Content of handoffs should focus on the acute and critically ill patients. The attending physician, chief resident, and nursing team leaders should participate in the handoff process.

Conclusions: Differences in goals and content focus between nurses and physician contributed to suboptimal communication and handoffs. Identifying the deficits allow opportunities for improvement in transitioning care and ultimately the safe and quality of care provided to patients. Participation in the process should include faculty physicians, chief residents, and nursing leaders.

Sponsor: N/A

IRB/IACUC#: JPS 080116.002e (FWA#00011753)

2603 - Poster **Classification:** TCOM DO Student

Presenter: Clayton McCuiston **Department:** Texas College of Osteopathic Medicine
Authors: Clayton McCuiston, UNT Health Science Center; Phong Duong, UNT Health Science Center; Rebecca Cunningham, UNT Health Science Center

The Impact of Environment on Hormone Replacement Therapy

Purpose: Women that have undergone long-term menopause exhibit elevated oxidative stress. Prior studies have found equivocal effects of hormone replacement therapy for women in menopause. It has been proposed that hormone replacement therapy is adverse for women 10 years post-menopause. Furthermore, post-menopausal women have a higher risk for Parkinson's disease than pre-menopausal women. Therefore, we propose that hormone replacement therapy is additive to oxidative stress, resulting in dopaminergic neuronal loss, a hallmark for Parkinson's disease.

Methods: In this study we used dopaminergic 27 cell line that originated from fetal female rats. Cells were exposed to an oxidative stressor, hydrogen peroxide (H2O2), to induce 20% cell death. Following H2O2, cells were treated with either testosterone (100 nM) or 17beta-estradiol (10 nM) to model hormone replacement therapy. Cell viability was assayed using the MTT protocol.

Results: H2O2 treatment decreased cell viability approximately 20%. Testosterone treatment further increased H2O2 cell loss by 60%. Although not as potent as testosterone, estradiol did exacerbate H202 induced cell loss by 40%. Neither testosterone nor 17beta-estradiol were damaging to cells in the absence of an oxidative stressor.

Conclusions: Depending on the cellular environment, both androgenic and estrogenic steroid hormones can negatively affect neuronal function.

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IRB/IACUC#: N/A

2604 - Poster **Classification:** Resident

Presenter: Leah Mello, MD **Department:** Obstetrics and Gynecology
Authors: Leah Mello, JPS Health Network; Ralph Anderson, UNT Health Science Center; Gennady Miroshnichenko, JPS Health Network; Erin Keck, UNT Health Science Center; Leah Zimmerman, UNT Health Science Center

Osteonecrosis Following Radiation and Osteoporosis

Objective: This case report describes osteonecrosis of the pelvis, two and half years after receiving radiation therapy for a leiomyosarcoma of the vagina in a 40 year old female.

Methods: The patient presented with a vaginal mass measuring 8 cm which on biopsy showed a leiomyosarcoma (20 mitotic figures / 10 high power fields). She had a resection of the tumor followed by radiotherapy to the pelvis and 6 months of Doxil chemotherapy finishing in March of 2013. Three years later she presented with pelvic pain and instability of walking. A combination of radiologic imaging including a CT scan of her pelvis, a bone scan and a MRI scan of her lumbosacral spine revealed necrotic lesions in the pelvic ischium and bilateral pelvic insufficiency fractures in the sacrum. Biopsy of the tissues showed necrotic tissue but no cancer. A DEXA scan was performed which showed diagnostic T scores as L spine -0.6, femoral neck -3.1, total hip -3.1, giving a WHO classification of osteoporosis.

Results: Her treatment for osteonecrosis and osteoporosis includes calcium, vitamin E, oyster shell, weight bearing exercises and Fosamax 70 milligrams daily. Her pain has improved and she no longer requires utilizing a walker.

Conclusions: In women who present with pelvic pain after pelvic radiotherapy, bony destruction and fractures can be indicative of a late radiation effect rather than osseous metastases. Patients with osteoporosis are at a much higher risk for developing post-radiotherapy osteonecrosis and fractures. Conservative treatment together with Fosamax have begun to show improvement in the clinical condition of the patient. Radiological imaging will be utilized as appropriate to determine improvement in the status of the pelvic bone.

Sponsor: N/A
IRB/IACUC#: 2017-044 N/A

2605 - Poster **Classification:** GSBS Student

Presenter: Tanir Moreno **Department:** Obstetrics and Gynecology

Authors: Tanir Moreno, UNT Health Science Center; Amy Raines-Milenkov, UNT Health Science Center; Eva Baker, UNT Health Science Center; Katherine N. Durbin, UNT Health Science Center; Victoria Kwentua, UNT Health Science Center; Emelda Thein, UNT Health Science Center; Halimo Mudey, UNT Health Science Center; Radhika Subedi, UNT Health Science Center; Laurette Rudasingwa, UNT Health Science Center

Threats to the Tradition and Practices of Breastfeeding in Refugees Following Resettlement in Tarrant County

Background: Few studies have investigated breastfeeding in refugee populations resettled in the United States. Of those that exist, studies have found that refugees face many challenges to exclusively breastfeeding their children due to conflict between their traditions and the U.S. culture, economy, and health care system. However, there has been no research studying these difficulties among recently arrived populations of refugees, such as the Bhutanese and Karen. The purpose of this study is to identify factors that threaten to disrupt breastfeeding practices in recently arrived populations of refugees following resettlement in Tarrant County.

Methods: Data for this study comes from previously collected focus group transcripts. Secondary data analysis was used from 5 focus groups from the Bhutanese, Karen, and Somali community. Thematic analysis was used to identify significant themes in the transcripts relating to the subject of the study. Analysis included reading of the text, coding the data, theme identification, and consolidating the information in order to identify the three primary threats to breastfeeding practices.

Results: Three main themes emerged. These included the influence of health care providers, the perception of existing U.S. breastfeeding practices, and the interference of work duties or financial issues. These influences were consistently found to have a negative impact on the continuation of exclusive breastfeeding among each refugee population.

Conclusions: Refugees are at a significant disadvantage of losing breastfeeding practices following resettlement and adjusting to a new culture in the U.S. However, the tradition and practice of exclusive breastfeeding should be a protected and promoted behavior. Cultural competence and consideration should be incorporated into the education of health care workers in order to promote breastfeeding and address, and when possible, remove threats to this positive maternal behavior.

Sponsor: Student Access to Medical Education Program
IRB/IACUC#: 2016002

2606 - Poster **Classification:** SPH Student

Presenter: Iram Qureshi **Department:** School of Public Health

Authors: Iram Qureshi, UNT Health Science Center; Amy Milenkov, UNT Health Science Center; Emelda Thein, UNT Health Science Center; Halimo Mudey, UNT Health Science Center; Laurette Rudasingwa, UNT Health Science Center; Radhika Subedi, UNT Health Science Center

Perspectives on Cancer and Cancer Screenings Among Refugee Immigrants

Purpose: The United States Preventive Services Task Force advises women to receive timely cervical, breast, and colorectal cancer screenings, however, studies show refugee women are less likely to receive these screenings. The purpose of this study is to identify cancer knowledge and barriers to recommended cancer screenings from the perspective of refugee women.

Materials and Methods: Female Lay Health educators from four refugee communities provided cancer education to women enrolled in the Building Bridges Imitative. Qualitative statements from participants were collected at the education sessions and post intervention assessments and grouped into themes

Results: The data collected showed that cancer screening practices were low and many cultural misconceptions on screening practices exist in refugee communities. Refugee women had limited knowledge on the cause of cancer and its ability to be treated.

Conclusions: Understanding more about the barriers to cancer screenings from the perspective of refugee women can help create or refine interventions. Culturally tailored cancer education interventions can be beneficial in correcting cancer and cancer screening myths among refugee populations

Sponsor: CPRIT
IRB/IACUC#: 2014-084

2607 - Poster **Classification:** SPH Student

Presenter: Uloma Igara UChe **Department:** Environmental & Occupational Health
Authors: Uloma Uche, UNT Health Science Center; Sumihiro Suzuki, UNT Health Science Center; Alisa Rich, UNT Health Science Center

Is Maternal Depression a Major Predictor of Language Development in Low Income Families?

Purpose: The purpose of the study is to analyze what impact maternal depression has on language development of children in low income families.

Methods: Using the national Early Head Start Research and Evaluation (EHSRE)[14] program, data was retrieved on maternal depression and child language development (birth to 3 years). Maternal depression was measured at time of recruitment (baseline) and 14 months (post-recruitment). Child language development measured at 14 and 24 months. A logistic regression was conducted to determine the association between maternal depression and child development while controlling for socioeconomic status, education, birth weight, early birth, maternal occupation, child gender and child age.

Results: 52% of eligible responding mothers at baseline had CES-D scale scores >16, the cut off score for depressive symptoms while at 14 months, 36% of biological mothers had CES-D scores >16. Depression was reported greater in African Americans withschool, neither employed nor in school/training, and household incomes < 99% poverty level. Using logistic regression, maternal depression at baseline and 14 months were not statistically associated with child language development at 14 and 24 months. Of the variables controlled for during the logistic regression analysis, child birth weight had a significant effect on child's ability to make gestures at 14 (p=0.02) and early birth remained a significant predictor of vocabulary production problems at 14 months (p=0.02).

Conclusions: Maternal depression in this low income population is not associated with child language development. This may be attributed to the fact that early exposures to biological and environmental risk factors have been identified to be associated with some developmental disabilities in children and studies have suggested that the consequences of these risk factors can be more severe for children in low income families. This, therefore, suggests that the impact of maternal depression on language development may not be a major predictor of language development for children in the low income families.

Sponsor: N/A
IRB/IACUC#: 2016-082

2608 - Poster **Classification:** TCOM DO Student

Presenter: Austin Baker **Department:** Obstetrics and Gynecology

Authors: Brett Westbrook, JPS Health Network; Ralph Anderson, UNT Health Science Center; Martha Felini, UNT Health Science Center; Austin Baker, UNT Health Science Center; Tracy Papa, JPS Health Network; Meagan Benson, JPS Health Network; Kellie Flood-Shaffer, JPS Health Network; Leah Zimmerman, UNT Health Science Center

Outcomes Associated with a Trial of Labor After Cesarean Section

Objective: To examine the outcomes of women attempting a trial of labor after cesarean section (TOLAC).

Methods: A retrospective chart review was performed on all patients who attempted a TOLAC from June 2012 to May 2016 at John Peter Smith Hospital (JPS). Delivery characteristics and prevalence of adverse delivery outcomes were assessed and then compared to a previous TOLAC study at JPS (2004-2008). Stratified analysis was performed and statistical significance was calculated with $\chi 2$ and fishers exact statistics ($\alpha<0.05$).

Results: 660 patients attempted a trial of labor during the study period. This was 2% of the total births at the hospital during the time period. 444/660 delivered vaginally (67%). Successful VBAC was significantly more likely when the patient presented in spontaneous labor versus when the patient was induced (74% vs 49%, p= <0.01). 24 patients (4%) had 2 or more previous cesarean sections. When compared to the study from 2004-2008, successful VBAC rate had decreased, (68% vs. 84%) and the rate of induction of labor had increased. (30% vs 4%).

Conclusions: The overall success rate of 67% is within the expected range based on public data. However, the success rate at JPS Hospital had decreased from the previous study. This decrease in success coincides with an increase in the rate of induction of labor. Indeed, the success rates for patients who are induced is lower than the patients who present in spontaneous labor. Based on this data, we will reevaluate our practice of induction of labor in trial of labor candidates.

Sponsor: N/A
IRB/IACUC#: 2016-081 N/A

Oral Presentations

Aging / Alzheimer's Disease (Abstracts in the 100s)

112 - Oral **Classification:** Postdoctoral Fellow
Presenter: Marc Anderson **Department:** Institute for Aging & Alzheimer's Disease Research
Authors: Marc Anderson Ph.D., UNT Health Science Center; Derek Schreihofer Ph.D., UNT Health Science Center; Rebecca Cunningham Ph.D., UNT Health Science Center

Chronic Intermittent Hypoxia Advances Hormonal Aging: Implications for Parkinson's Related Sexual Dysfunction

Purpose: Chronic intermittent hypoxia (CIH) is an established model for sleep apnea and a common comorbidity in Parkinson's disease (PD). Further, CIH is a known inducer of oxidative stress (OS), which is a key characteristic of PD and aging. Interestingly, in men both sleep apnea and PD are strongly linked with sexual dysfunction. However, it is unknown if CIH induces sexual dysfunction. Therefore, we examined the role of CIH on steroid hormones, sex behaviors, neuropeptides associated with social behaviors, and OS generation in young and old rats.

Methods: Young (3-months) and old (12-months) male F344/BNF1 rats, were exposed to either mild CIH or normoxic conditions. CIH consisted of cycling oxygen levels from 21% to 10% over a span of 6 minutes during the rat's sleep phase for a total of ten days. Sex behavioral tests were conducted to examine the influence of CIH. Specifically, the frequency and latencies of mounts, intromissions, and ejaculations were quantified. At the end of testing, plasma was collected and assayed for testosterone (T), corticosterone (C), vasopressin (AVP), oxytocin (OXY), and advanced oxidation protein products (AOPP).

Results: Old rats had impaired sex behaviors compared to young rats. However, CIH induced sexual dysfunction in young rats, consistent with behaviors in old rats. Accordingly, in young rats CIH decreased T, increased C, and increased OS, as indicated by AOPP. CIH did not alter OXY and AVP in young rats. Interestingly, in old rats CIH had no effect on sexual behavior, T, C, OXY, or AVP, indicating that age may have a ceiling effect.

Conclusions: Results show that mild CIH advances hormonal aging. Hormonal aging is an understudied phenomenon in PD and in sleep apnea. Therefore, PD progression may be halted by examining the influence of sleep apnea induced hormonal aging.

Sponsor: NIH - National Institutes of Health
IRB/IACUC#: 2014.15-50-A05

113 - Oral **Classification:** GSBS Student

Presenter: Jo Garza-Contreras **Department:** Pharmacology & Neuroscience
Authors: Jo Garza-Contreras, UNT Health Science Center; Phong Duong, UNT Health Science Center; Brina Snyder, UNT Health Science Center; Rebecca Cunningham, UNT Health Science Center

Novel Androgen Receptor Protein in Brain: Implication for Parkinson's Disease

Objective: Men have a two-fold increased risk for Parkinson's disease (PD) than women. Testosterone, the major male sex hormone, can increase calcium influx and cell death in dopamine neurons via a putative membrane androgen receptor (mAR). The mAR induced calcium increase may be due to activation of Gaq protein-coupled receptor (GPCR) that is involved in calcium mobilization. Currently, the mAR remains unidentified. Recent studies only found miniscule levels of androgen receptors (AR) in the substantia nigra (SN). This low AR expression in the SN may be due to absence of full length classical AR that contains an N terminus domain (NTD), especially as these studies used an antibody targeting the AR NTD. It is possible that ARs in the SN consist of a splice variant that does not possess a NTD, such as AR45. AR45 is not able to be assayed using an NTD antibody, and thus we used a C-terminus domain (CTD) antibody. Therefore, we hypothesize that the putative mAR is the AR45 splice variant that acts through a Gaq GPCR.

Materials and Methods: We examined the expression of classical full length AR and AR45 in a dopaminergic N27 cell line and rat SN. Protein expression of AR and AR45 was quantified by Western blot analysis and immunohistochemistry (IHC). We used antibodies targeting either the NTD or CTD of the AR, along with antibodies targeting Gαq, Gαs and Gαo GPCRs. To determine the association between mAR and GPCR subunits we performed co-immunoprecipitation using AR-CTD and Gaq antibodies.

Results: Our results showed that the SN and the N27 cells express very low AR-NTD positive cells, indicative of low full length classical AR expression. However, both N27 cells and SN showed very high levels of AR-CTD positive cells. Furthermore, protein expression of AR-CTD was observed at 45 kDa molecular weight, which is consistent with the AR splice variant, AR45. This AR45 splice variant was found to be associated with Gaq in both N27 cells and SN.

Conclusions: Our data indicates that the mAR in dopaminergic neurons is the AR45 splice variant, which is associated with a Gaq subunit. These results provide a mechanism for our prior studies wherein testosterone increased intracellular calcium levels. This is the first observation of an AR splice variant in neuronal tissue. Further characterization of this protein may provide a novel therapeutic target to slow the progression of PD in men.

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IRB/IACUC#: 2014/15-30-A05

115 - Oral **Classification:** GSBS Student

Presenter: Brina Snyder **Department:** Institute for Aging & Alzheimer's Disease Research
Authors: Brina Snyder, UNT Health Science Center; Rebecca Cunningham, UNT Health Science Center

Preconditioning Underlies Testosterone's Protective Effects Against Neurodegeneration

Purpose: The incidence of neurodegenerative diseases (ND) such as Alzheimer's disease and Parkinson's disease is expected to rise over the next 40 years. Diagnosis occurs at advanced stages, and there is no cure or treatment for ND. Early identification of risk factors for ND may provide effective therapy targets. Because ND arises differently between men and women, major sex hormones may play a role. Many studies have examined the effects of estrogen, but not testosterone (T). T has been shown to be protective or damaging depending on the oxidative stress (OS) environment in cells. Sleep apnea is a comorbidity of ND, occurs more frequently in men than women, and is associated with decreased T. Our lab has shown that a rodent model of mild sleep apnea, chronic intermittent hypoxia (CIH), elevates OS and inflammation in brain regions associated with early-stage ND. We propose that T will protect against CIH-induced damage.

Methods: Male Long-Evans rats will be divided into 3 groups: gonadectomized with cholesterol (GDX+C) or physiological T (GDX+T); gonadally intact (Intact). Afterwards, rats were exposed to eight minute cycles of alternating 10% and 21% oxygen to mimic the hypoxemia experienced by patients with sleep apnea. This cycle ran continuously for eight hours a day during the light phase for seven days. Following 7 days of CIH, behaviors associated with memory and motor function were assessed: Morris Water Maze, the novel object task, and a modified open field assay. Plasma and tissue punches from the entorhinal cortex (ETC) and substantia nigra (SN) were collected and tested for levels of OS, T, and inflammation, using Advanced Oxidative Protein Products (AOPP), ELISA, and multiplex immunoassays, respectively.

Results: GDX+T had significantly more T than Intact and GDX+C, due to the CIH-induced decline in endogenous T levels in Intact rats. CIH increased OS and inflammation in GDX+C and Intact rats, whereas there was no effect in GDX+T. Rats exposed to room air were not impaired, regardless of hormone status.

Conclusions: Maintenance of T is protective against OS and inflammation, key markers of ND. T loss was associated with behavioral deficits following an OS insult.

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IRB/IACUC#: 2014/15-50

Cardiovascular (Abstracts in the 400s)

426 - Oral **Classification:** GSBS Student
Presenter: Justin Sprick **Department:** Institute for Cardiovascular and Metabolic Disease
Authors: Justin Sprick, UNT Health Science Center; Hannah Colby, UNT Health Science Center; Caroline Rickards, UNT Health Science Center

Combined Effects of Remote Ischemic Preconditioning and Aerobic Exercise on Sympathetic Responses: A Novel Adaptation of Blood Flow Restriction Exercise

Purpose: Remote ischemic preconditioning (RIPC) is an innovative therapy used to attenuate tissue damage sustained by ischemia-reperfusion injury. Blood flow restriction exercise (BFRE) is a training method that also limits blood flow to the active muscles during exercise. We implemented a novel approach to BFRE with cyclical bouts of blood flow restriction and reperfusion, reflecting the RIPC model, which could elicit similar protection against ischemia-reperfusion injury. A concern about the use of BFRE, however, is the potential amplification of the exercise pressor reflex, which could be unsafe in at-risk populations. We hypothesized that cyclical BFRE would elicit a greater increase in sympathetic outflow and arterial pressure than conventional exercise (CE) when performed at the same relative heart rate (HR) intensity.

Methods: 11 subjects (6M/5F) performed two 40-min treadmill exercise bouts at 65-70% of maximal HR. In the BFRE condition, cuffs around the upper thighs were inflated to 220 mmHg for 4 cycles of 5-min cuff inflation (occlusion)/5-min cuff deflation (reperfusion). The CE condition was identical, but without application of the cuffs. Mean arterial pressure (MAP), and plasma norepinephrine concentrations [NE] were compared between trials.

Results: As hypothesized, BFRE resulted in higher [NE] compared to CE (923±92 vs 782±68 pg/ml; P=0.05). Unexpectedly, however, there were no differences in MAP between conditions during the cuff inflation time periods (BFRE vs. CE; P≥0.12)), and MAP was lower with BFRE during all 4 reperfusion periods compared to the CE trial (Cycle 1: BFRE vs. CE, 103±3 vs 107±2 mmHg; Cycle 2: 98±2 vs 103±2 mmHg; Cycle 3: 96±2 vs 102±2 mmHg; Cycle 4: 95±2 vs 100±2 mmHg; P≤0.04).

Conclusions: BFRE elicited an exaggerated sympatho-excitatory response compared to CE as evidenced by higher plasma [NE]. This response was not accompanied by higher arterial pressures, however, most likely due to the cyclical nature of the occlusion/reperfusion protocol. The reactive hyperemia resulting from each cuff deflation may have offset the expected sympathetically-mediated increase in arterial pressure, resulting in an attenuation of the exercise pressor reflex. In conclusion, this novel cyclical BFRE paradigm could be applied to the clinical setting, such as cardiac or stroke-rehabilitation, where patients are already engaged in an exercise program, but where they could also benefit from the protection associated with RIPC.

Sponsor: NIH Training Grant T32 AG 020494, Texas Chapter of the American College of Sports Medicine Student Research Development Award
IRB/IACUC#: 2014-149

Cell Biology (Abstracts in the 600s)

603 - Oral **Classification:** Postdoctoral Fellow
Presenter: Sebastian Requena **Department:** Biomedical Sciences
Authors: Sebastian Requena, UNT Health Science Center; Olga Ponomarchuk, Centre de recherche du CHUM (CRCHUM); Marlius Castillo, Texas Christian University; Jonathan Rebik, Texas Christian University; Emmanuelle Brochiero, Centre de recherche du CHUM (CRCHUM); Ryszard GrygorczYk, Centre de recherche du CHUM (CRCHUM); Sergei Dzyuba, Texas Christian University; Ignacy Gryczynski, UNT Health Science Center; Zygmunt Gryczynski, Texas Christian University; Julian Borejdo, UNT Health Science Center; Rafal Fudala, UNT Health Science Center

Measuring Intracellular Mucin Viscosity in Human Bronchial epithelial cells with Cystic Fibrosis

Background: Cystic fibrosis (CF) is a genetic disease which causes mucus to be abnormally thick and viscous. The thick mucus harbors bacteria and particulates and is unable to be cleared by the mucociliary system resulting in respiratory disease. Understanding mucus pathology is critical to understanding and treating diseases like CF. While many factors that influence CF mucus to be unusually thick are known, the question remains if there are differences in the viscosity of the mucus before secretion. Before being secreted, mucus exists as granules in the cell known as mucin. In this work, we examine the viscosity of intracellular mucin of human bronchial epithelial cells with and without cystic fibrosis.

Methods: We use a simple fluorescent phenyl-BODIPY rotor molecule which is readily uptaken into mucin granules and exhibits dramatic changes in its fluorescent lifetime as a function of its environments viscosity. To measure the distribution of viscosities in intracellular mucin, we use time-resolved fluorescent microscopy to image the non-CF and CF cells and measure the fluorescent lifetime of the probe in intracellular mucin. We employ a machine learning algorithm to analyze the pictures and use a combination of Python and ImageJ to compute the size and viscosity distribution of intracellular mucin granules.

Results: Our results show that our molecular rotor is readily uptaken into mucin granules of human epithelial cells. The changes in fluorescent lifetime are substantial enough to determine the apparent viscosity distribution of intracellular mucin granules. The non-CF cells have a single normally distributed peak in the viscosity distribution centered at 560 cP. The CF cells have a bimodal distribution with a peak at 560 cP and an additional peak at 210 cP. The origin and implications this second low viscosity group of mucin granules in is unclear but may provide biophysical insight into CF mucus pathology.

Conclusions: Our phenyl-BODIPY molecular rotor in combination with fluorescent lifetime imaging microscopy is a promising method to study the intracellular viscosity distribution of cells. Our results suggest that there is a distinct difference in the viscosity of mucin granules in non-CF cells versus CF cells. We believe our work will provide a new tool for investigators to study intracellular mucin and examine a variety of mucus related diseases.

Sponsor: N/A
IRB/IACUC#: N/A

Eye / Vision (Abstracts in the 1000s)

1016 - Oral **Classification:** GSBS Student
Presenter: Humberto Hernandez **Department:** North Texas Eye Research Institute
Authors: Humberto Hernandez, UNT Health Science Center; Wanda Medina-Ortiz, UNT Health Science Center; Stacy Curry, UNT Health Science Center; Tomi Luan, UNT Health Science Center; Abbot F. Clark, UNT Health Science Center; Colleen M. McDowell, UNT Health Science Center

Crosstalk Between Transforming Growth Factor Beta-2 and Toll-Like Receptor 4 in the Trabecular Meshwork

Purpose: The trabecular meshwork (TM) plays an important role in the regulation of aqueous humor outflow and intraocular pressure (IOP). Regulation of the ECM by TGFβ2 in the TM and toll-like receptor 4 (TLR4) in fibrogenesis has been extensively studied. Here, we investigate the role of TGFβ2-TLR4 signaling crosstalk and BMP/activin membrane-bound inhibitor (BAMBI) in the regulation of the TM ECM and ocular hypertension.

Methods: TLR4 expression was evaluated in cross-sections of human donor eyes, primary human TM cells, and dissected mouse TM rings. TM cells were treated with TGFβ2 (5ng/ml), TLR4 inhibitor (TAK-242, 15mM), and/or TLR4 ligand (cFN-EDA, 10mg/mL). A/J (n=13), AKR/J (n=7), BALBc/J (n=8), C3H/HeJ (n=20), and C3H/HeOuJ (n=10) were injected intravitreally with Ad5.hTGFβ2. Further, B6;129S1-Bambi$^{tm1Jian/J}$ mice were injected intravitreally with either Ad5.TGFβ2 (n=10), Ad5.Cre (n=9), or Ad5.TGFβ2 + Ad5.Cre (n=10). The uninjected contralateral eyes served as controls. Mouse TM (MTM) cells were isolated from B6;129S1-Bambi$^{tm1Jian/J}$ mice using magnetic beads and transduced with Ad5.TGFβ2 or Ad5.Cre in cell culture.

Results: TLR4 is expressed in the human and mouse TM. Inhibition of TLR4 signaling in the presence of TGFβ2 decreases fibronectin expression. Activation of TLR4 by cFN-EDA in the presence of TGFβ2 further increases fibronectin, laminin, and collagen-1 expression, and TLR4 signaling inhibition blocks this effect. Ad5.hTGFβ2 induces ocular hypertension in wild-type mice but has no effect in Tlr4 mutant (C3H/HeJ) mice. Ad5.Cre, Ad5.TGFβ2, or Ad5.TGFβ2 + Ad5.Cre each induced ocular hypertension significantly throughout the time course compared to uninjected control eyes. Bambi knockdown by Ad5.Cre leads to increased fibronectin expression in MTM cells.

Conclusions: Here we show a TGFβ2-TLR4 crosstalk pathway that we hypothesize is regulated by TGFβ2 negative regulator BAMBI. Conditional knockdown of BAMBI in the TM with Ad5.Cre induces fibronectin expression, reduces aqueous humor outflow facility and causes ocular hypertension. These data provide a novel pathway involved in the development of glaucomatous TM damage and provide potential new targets to lower IOP.

Sponsor: R01EY026529, T32AG020494, G2014063
IRB/IACUC#: 2015-0002

Immunology (Abstracts in the 1400s)

1405 - Oral **Classification:** GSBS Student
Presenter: Maximillion T. Mize **Department:** Pharmaceutical Science
Authors: Maximillion Mize, UNT Health Science Center; Jerry Simecka, UNT Health Science Center

IL-17A(+) CD4(+) T-Cells and Neutrophils Contribute to Lung Pathology during Murine Mycoplasma Infection

Background: Current research cannot fully explain how mycoplasma promote airway inflammation. It is no surprise that current vaccines promote lung damage. We showed that T-cells drive resistance and pathology in mice infected with Mycoplasma pulmonis. T-cells are important in vaccine-associated immunity. Our goal is to improve the effectiveness of current vaccines by understanding how T-cells contribute to disease outcome.

IL-17A is secreted by T-cells and activates neutrophils during infection. However, overzealous IL-17A production activates immune responses that cause disease. We found elevated IL-17A mRNA and protein levels in mice infected with M. pulmonis. Lung lesions in cattle infected with Mycoplasma mycoides contain IL-17A. What IL-17A does during disease is still not known. I hypothesis that IL-17A contributes to disease pathology during murine mycoplasma infection.

Methods: M. pulmonis is a natural pathogen of mice, infection mimics other mycoplasma diseases. Here, BALB/c mice were infected with M. pulmonis as previously described. Disease was monitored in mice receiving either PBS or antibodies against IL-17A and Ly6G. Flow cytometry and immunostaining were used to identify phagocytes and IL-17A$^+$ lymphocytes in the lung.

Results: T-cells produce IL-17A during infection with M. pulmonis. IL-17A$^+$ T-cells exist in the lungs prior to infection and may contribute to the rapid recruitment of neutrophils into the respiratory tract immediately after inoculation. αβ CD4$^+$ T-cells was the predominant T-cell population producing IL-17A throughout infection.

By Day 14, αβ T-cells in the lungs and lower respiratory lymph nodes were able to secrete IL-17A alone, or in combination with IFN-γ. Expression of ROR-γt was not required for IL-17A production by αβ T-cells in the lung. Immunostaining revealed that IL-17A$^+$ CD4$^+$, and not IL-17A$^+$ CD8$^+$, were located within inflammatory lesions.

Neutralizing IL-17A reduced host damage without impacting bacterial burden. Neutrophilic lesions were lower in response to IL-17A neutralization. Depletion of neutrophils was more effective at reducing pathology when compared to IL-17A neutralization. Combining IL-17A neutralization with neutrophil depletion failed to further reduce the disease pathogenesis.

Conclusions: Neutrophils and IL-17A$^+$ T-cells contribute to pathogenesis during murine mycoplasma infection. These cells may act independently to promote inflammation. IL-17A may exacerbate neutrophil-dependent pathology.

Sponsor: American Society for Microbiology (ASM)
IRB/IACUC#: 2016-0042

1406 - Oral **Classification:** GSBS Student

Presenter: Busola Okunnu **Department:** Biomedical Sciences

Authors: Busola Okunnu, UNT Health Science Center; Naomi Swanta, UNT Health Science Center; Rance Berg PhD, UNT Health Science Center

The Role of ecSOD in Neutrophil Containment of Listeria Monocytogenes

Background: Extracellular superoxide dismutase (ecSOD) is an antioxidant that serves to minimize host tissue damage during reactive oxygen species (ROS) mediated immune responses. Listeria monocytogenes (LM) is an intracellular bacteria that is often used to study host pathogen interactions during intracellular bacterial infections. Previously, we showed that ecSOD activity is detrimental to the host during infection with LM. Furthermore, using depletion studies, we determined that neutrophils, a set of innate immune cells which are known for ROS generation, from mice that lack ecSOD (ecSOD KO) are more protective during LM infection.

Materials and Methods: Using ecSOD congenic mice (expressing differing activities of ecSOD as indicated by their titles; ecSOD HI, ecSOD Wild Type, ecSOD Knockout), flow cytometry and a unique LM termed actA:LMGFP, we set out to determine how ecSOD activity modulates the protective capabilities of neutrophils during LM infection.

Hypothesis: We hypothesized that ecSOD activity would hinder the ability of neutrophils to keep LM contained in the phagosome and therefore suppress their ability to ultimately kill the bacteria.

Results: In vitro, a higher percentage of neutrophils from the liver, spleen, bone marrow, and peritoneal cavity ecSOD KO mice, allowed for phagosomal escape in comparison to the ecSOD expressing neutrophils. In vivo, at a high dose of infection, a similar trend was observed in the spleen, although, the opposite occurred in the liver. However, using MFI as an indicator of the relative number of bacteria per neutrophil, we observed that the ratio of cell associated to cytosolic bacteria was higher in ecSOD KO neutrophils in comparison to neutrophils with ecSOD activity. The next step was to determine if ecSOD modulates neutrophil protective mechanism downstream of phagosomal containment, mainly, autophagy. It was observed that phagosomal escape correlates with the initiation of autophagy in bone marrow neutrophils. However the effect on neutrophils from other organs is currently inconclusive.

Conclusions: EcSOD activity does appear to modulate neutrophil association with LM. Lack of ecSOD activity increases association of the bacteria with neutrophils but simultaneously decreases the phagosomal escape of the bacteria into the cytosol. However, the presence of cytosolic bacteria induces the initiation of autophagy as a mechanistic means of keeping LM contained which should eventually lead to killing by the neutrophil.

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Microbiology / Infectious Disease (Abstracts in the 1600s)

1608 - Oral **Classification:** GSBS Student
Presenter: Kathleen Borgmann **Department:** Cell Biology and Anatomy
Authors: Kathleen Borgmann, UNT Health Science Center; Anuja Ghorpade, UNT Health Science Center

TAARgeting Astrocyte Mitochondrial Dysfunction during HIV-associated Neuroinflammation and METH Exposure.

Purpose: Methamphetamine (METH) use exacerbates HIV-1 infection, accelerating the severity and onset of HIV-associated neurocognitive disorders (HAND), along with immune dysfunction and resistance to antiretroviral therapy. Neurocognitive impairment is more prevalent in HIV+ METH users than either HIV+ or METH+ alone. A common neurotoxic mechanism during HIV CNS infection is mitochondrial impairment leading to oxidative stress. METH directly and indirectly contributes to mitochondrial impairment; however, the mechanisms regulating mitochondrial homeostasis and overall oxidative burden in astrocytes are not well understood in the context of HIV-associated neuroinflammation and METH abuse. We have reported that astrocyte-trace amine associated receptor 1 (TAAR1) is induced by HAND-relevant stimuli and binds METH, leading to cAMP/calcium signaling and impaired glutamate clearance during HIV. We hypothesize that METH-abuse in HAND modulates astrocyte-TAAR1 levels and activity, regulating astrocyte-mediated neurotoxic outcomes, including mitochondrial damage and increased oxidative burden.

Methods: TAAR1-mediated regulation was evaluated with siRNA or the selective inhibitor, EPPTB. Mitochondrial size was assessed by MitoTracker Red™ labeling and fluorescent microscopy. The effects of METH on oxygen consumption were measured by extracellular flux Seahorse assay, while changes in gene expression were measured by real-time PCR, western blotting and WES protein assays respectively.

Results: Here we report METH-mediated impairment of astrocyte mitochondrial recycling during prolonged exposure in the context of HIV, including enlarged mitochondrial size, mitofusin recruitment, altered oxygen consumption and increased resulting oxidative burden. Further, astrocyte TAAR1 appears to regulate mitochondrial recycling.

Conclusions: TAAR1 may be a valid therapeutic target to ameliorate astrocyte-mediated neurodegeneration in HAND and METH abuse.

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1609 - Oral **Classification:** GSBS Student
Presenter: John C. Vitucci **Department:** Pharmaceutical Science
Authors: John Vitucci, UNT Health Science Center

The In Vitro Adherence and Virulence Factors of Clostridium Difficile Ribotypes 027 and Non-027 is Not Predicative of Virulence in the Murine or Hamster CDAD Model

Background: C. difficile ribotype 027 (RT027) is the North American epidemic strain. Studies suggest an enhanced virulence phenotype for RT027 such as increased toxin production, but the impact on disease severity on in vivo models is not well understood. This study describes the in vitro characterization of important virulence characteristics for several RT027 and non-RT027 C. difficile clinical isolates, and how these factors are not predictive of disease severity in the hamster C. difficile associated disease (HCDAD) model.

Methods: Six RT027 and six non-RT027 clinical isolates were evaluated in vitro for total spore counts and Toxin A/B titers in 72H broth cultures. Spore counts were generated from heat/ethanol shock culture samples and plated onto CB + taurocholate + antibiotics, and toxin A/B titers were determined from spent broth with an ELISA assay. The Murine C. difficile model involved antibiotics administered for 5 days through drinking water. The mice were then given 48 hours to clear the antibiotic from their system before the administration of 10 mg/kg clindamycin, followed 24H later by administration of spores from either an 027 or non-027 isolate. Survival was monitored for 10 days and fecal samples were taken each day to be processed for CFU/spore counts. The HCDAD studies involved infecting male Golden Syrian hamsters with varying titers of RT027 and non-RT027 spore isolates, followed by subcutaneous administration of 10 mg/kg clindamycin 24H post-infection. All groups were left untreated and survival was monitored for 7 days after infection, samples were collected every day for CFU/spore counts and Toxin A/B titers.

Results: The RT027 and the non-RT027 strains generated similar mean CFU/mL in 72H broth cultures, while the mean spore counts were 83 spores/one million cells for the RT027 strains and 123 spores/one million cells for the non-RT027 strains. While, the 72H broth-associated mean toxin A/B titers were 2.8-fold higher for RT027 strains when compared to the 72H titers of non-RT027 strains. In the HCDAD studies the non-027 infected hamsters survived with inoculation counts of up to 20,000 spores, while hamsters infected with the RT027 isolates survived inoculation with counts below 300 spores. The mean cecal fluid toxin A/B titers for RT027 infected hamsters were 2.3 to 9-fold higher than the titers for non-RT027 infected hamsters. In the mouse model, 90% of the animals infected with the non-027 isolate survived no matter the antibiotic dosing. In contrast, 13-26% morbidity was associated with mice infected with the RT027 isolate after being given antibiotics in multiple doses or in a single does through over time through supplemented water.

Conclusions: The results highlight that C. difficile RT027 isolates, when compared to non-RT027 clinical isolates, have enhanced virulence in vivo that does not correspond to a strain's predicted virulence from in vitro characterization.

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Molecular Genetics (Abstracts in the 1700s)

1705 - Oral **Classification:** GSBS Student
Presenter: Frank R Wendt **Department:** Graduate School of Biomedical Sciences
Authors: Frank Wendt, UNT Health Science Center; Antti Sajantila, University of Helsinki; Ranajit Chakraborty, UNT Health Science Center; Gita Pathak, UNT Health Science Center; Rodrigo S. Moura-Neto, Universidade Federal do Rio de Janeiro; Bruce Budowle, UNT Health Science Center

Towards a Comprehensive Pharmacogenetic Profile for Predicting Opiate Metabolizer Phenotype

Purpose: The gene encoding cytochrome p450 family 2 subfamily D polypeptide 6 (CYP2D6) is a key pharmacogenetic marker for an enzyme which confers poor, intermediate, extensive, and ultrarapid phase I metabolism of many endogenous toxins and foreign compounds, including marketed opiate-based drugs. The pharmacogenetics of opiate metabolism is particularly important due to the relatively high incidence of addiction and overdose of opiates. Recently, trans-acting opiate metabolism and analgesic response enzymes (UGT2B7, ABCB1 [also called p-glycoprotein and/or multi-drug resistant protein], OPRM1, and COMT) have been incorporated into pharmacogenetic studies to generate more comprehensive metabolic profiles of patients. While meaningful, these studies are limited in that demography is not documented during sample selection, and use of targeted genotyping approaches inherently cannot detect novel variants. With use of massively parallel sequencing, it is possible to identify additional polymorphisms that fine tune, or refine, previous pharmacogenetic findings.

Methods: The 1000 Genomes Project data were analyzed in two phases: (1) To describe population genetic variation and summary statistics for these five genes in self-reported healthy individuals in five super- and 26 sub-populations; and (2) To utilize individual polymorphism data to form full-gene haplotypes of the five genes of interest in the same sample set to use full-gene information to refine metabolizer phenotype estimates. Both phases of this work were performed using R Studio®, Excel-based workbooks, Genetic Data Analysis, and TreeView.

Results: A summary is provided of population statistics, variant effect predictions, and clustering of super- and sub-populations based on pharmacogenetically relevant polymorphisms in five genes whose protein products are associated with opiate metabolism. Comparisons of current standards versus full-gene metabolizer phenotype predictions indicate that a full-gene approach provides better resolution of metabolizer phenotype. These data also indicate that a substantial portion of extensive metabolizers may be incorrectly classified as such due to novel damaging polymorphisms elsewhere in the gene.

Conclusions: The results of these studies serve as substantial baseline population genetic data of individual pharmacogenetically relevant polymorphisms and highlight the advantage of using full-gene sequence information to infer metabolizer phenotypes.

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Neuroscience (Abstracts in the 1800s)

1816 - Oral **Classification:** GSBS Student
Presenter: Thomas Mock **Department:** Pharmacology & Neuroscience
Authors: J Thomas Mock, UNT Health Science Center; Jessica Wong, UNT Health Science Center; Phillip Vann, UNT Health Science Center; Delaney L. Davis, UNT Health Science Center; Michael J. Forster, UNT Health Science Center; Nathalie Sumien, UNT Health Science Center

Sexual Dimorphism in Mouse Age-Related Motor Impairments

Purpose: Clinical measures such as frailty, disability, and strength loss are correlated with decreased survival and are more prevalent in women, yet men have a higher mortality risk at all ages. This contradictory sexual dimorphism in mortality versus morbidity is not fully understood. Furthermore, many pre-clinical studies using rodents have combined sexes or tested only males which limits the possible inferences regarding sex-dependent changes in function across the lifespan as well as inferences relating to interventions. Therefore, the purpose of this study was to examine murine sexual dimorphism in age-related motor function decline. Our hypothesis was that motor impairments would increase with age, and that these deficiencies would be exacerbated in females.

Methods: Male and female C57BL/6J mice were tested at 5, 10, and 20 months of age. Animals underwent a battery of behavioral tests measuring difference aspects of motor function, including tests measuring coordinated running and motor learning (rotorod), strength (wire suspension), and balance (bridge walking). Resulting dependent measures were analyzed using two-way analyses of variance with Age and Sex as between-groups factors and two-way repeated measures analyses of variance with Session as the within group factor.

Results: Rotorod performance (learning and maximum) declined with age in both sexes, however declines were smaller for females at 10 and 20 months compared to the males. Latency to fall from the wire was significantly shorter in adult and old males compared to their young counterpart, while there was no significant differences in the females. Bridge walking performance declined in both males and females, but there was a larger decline in the males. Furthermore, age-related decline in balance was observed in the females only on the most difficult bridge, while age-related declines were apparent on all the bridges for the males.

Conclusions: These data support that age-related decline leads to measurable changes in mouse motor function. However these deficits occur primarily in the males whereas females displayed fewer and smaller declines in motor function. This suggests that combining sexes or testing only a single sex could lead to limited results. Interestingly, women are typically more sensitive to age-related functional decline, while female mice in our study were less affected by age-related decline. In conclusion, this study highlights the importance of including both sexes in rodent pre-clinical research.

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1817 - Oral **Classification:** GSBS Student

Presenter: Alison Wagner **Department:** Pharmacology & Neuroscience

Authors: Alison Wagner, University of North Texas Health Science Center at Fort Worth; Ritu Shetty, University of North Texas Health Science Center at Fort Worth; Michael Forster, University of North Texas Health Science Center at Fort Worth

Identification of Stable Individual Variation in Learning Of Drug-Associated Cues in Mice

Purpose: Conditioned place preference (CPP) is a behavioral assay used to assess learning of drug-associated cues and drug reward. Though the reliability of the assay is established, considerable variability exists when examining the outcome of conditioning in individual mice. Indeed, at doses expected to produce robust CPP, some mice exhibit weak preference, or even aversion. The present study characterized the reliability and stability of these CPP phenotypes (i.e. robust, weak, or averse) to determine if they represent true individual differences. These phenotypes were investigated using the psychostimulants d-amphetamine and methylenedioxypyrovalerone (MDPV), as recent studies and trends in drug use suggest that synthetic cathinones, such as MDPV, have a high potential for abuse.

Materials/Methods: The CPP phenotypes were examined in subsets of two hundred fifty-two male Swiss-Webster mice used in dose-response studies, in which separate groups received either saline, MDPV, or d-amphetamine. These groups were subsequently assessed for conditioned place preference. One post-test was conducted at 24 hours after the initial test in a group receiving 2.5 mg/kg d-amphetamine. Three post-tests were conducted at 24, 48, and 72 hours after the initial test in groups receiving 10 mg/kg MDPV and 0.5 mg/kg d-amphetamine. At the initial test session, outcome of conditioning was examined by calculating a preference score; higher preference score indicated greater learning. Pearson's r was used to analyze the relationship between place preference during the test and the post-tests. An Analysis of Variance was used to ensure the partitioning criteria were appropriate and the phenotypes were, in fact, separate groups.

Results: When examining preference scores, three distinct phenotypes emerge. Data from groups receiving 10 mg/kg MDPV and 0.5 and 2.5 mg/kg d-amphetamine demonstrate a strong correlation between the initial test and the post-test(s).

Conclusions: Outbred mice exhibit differential conditioning to psychostimulants, a phenomenon that can be qualified by distinct phenotypes. These phenotypes are stable over additional post-tests, as mice seem to persist in the phenotype they exhibit during the initial test. Taken together, these results suggest robust individual differences in the development of place preference.

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Pharmacology (Abstracts in the 2100s)

2105 - Oral **Classification:** GSBS Student
Presenter: Sean Dolan **Department:** Institute for Healthy Aging
Authors: Sean Dolan, UNT Health Science Center; Michael Gatch, UNT Health Science Center

Methylone: "Ecstasy" by Another Name

Purpose: Following increased governmental intervention regarding the sale of novel psychoactive substances, the synthetic cathinone derivative methylone has been diverted from “bath salts” into “Ecstasy” formulations in lieu of MDMA; however, it is unknown what effects substitution with methylone may have on “Ecstasy” use. In the current study, we evaluated the pharmacology of methylone in parallel with MDMA using in vitro and in vivo techniques in order to assess its potential for compulsive abuse.

Methods: We assessed the activity of methylone and MDMA at SERT using whole-cell patch clamp electrophysiology. We determined the dopaminergic and serotonergic contributions to the discriminative stimulus effects of both compounds in rats trained to discriminate methamphetamine, DOM, or MDMA from vehicle and utilized the D1-selective antagonist SCH23390 and the 5-$HT_{2A/2C}$ antagonist pirenperone to further probe mechanistic differences. Furthermore, we tested for substitution of methylone and MDMA in rats trained to self-administer methamphetamine under continuous and progressive ratio schedules of reinforcement.

Results: Methylone, like MDMA, produced an inward current at SERT, indicative of an amphetamine-like substrate mechanism. Both methylone and MDMA fully substituted for the discriminative stimulus effects of methamphetamine and MDMA, but only partially for DOM. In methamphetamine-trained rats, SCH2330 fully and dose-dependently attenuated methamphetamine-appropriate responding by methylone and MDMA with similar potencies. SCH23390 and pirenperone both partially attenuated MDMA-appropriate responding by methylone and MDMA, but both antagonists were less efficacious against methylone than MDMA. Methylone and MDMA were both readily self-administered, but there were no significant differences in reinforcing efficacy between the two drugs under either schedule of reinforcement.

Conclusions: These data indicate that methylone possesses similar mechanistic and reinforcing effects as MDMA, and its inclusion in “Ecstasy” formulations is unlikely to produce different subjective effects or increased compulsive use.

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2106 - Oral **Classification:** GSBS Student

Presenter: Huanyu Wang **Department:** Pharmacology & Neuroscience

Authors: Huanyu Wang, UNT Health Science Center; Dhwanil Dalwadi, UNT Health Science Center; John Schetz, UNT Health Science Center

A Biotechnology Platform for Fighting Mosquito-Borne Disease Transmission

Background: Zika, West Nile virus, dengue and malaria are infectious diseases transmitted by the bite of a mosquito. Thus, technologies that prevent biting will prevent infectious disease transmission. Octopamine is a biogenic amine that controls key physiological responses including those related to fine motor control. Since biting requires fine motor control, disruption of octopaminergic systems appears to be an attractive approach to prevent mosquito biting. Every year, over a billion mosquito-borne disease cases were reported and increasing resistance of mosquitoes to first-line control measures is a cause for growing concern. To address this concern we seek to discover and develop new chemical classes of arthropod octopamine receptor deterrents to prevent biting. Our hypothesis is that at mosquito octopamine receptor activators will prevent mosquito biting.

Methodology: Cloned octopamine receptors from two species of mosquitoes Anopheles gambiae (AgOctR) and Aedes egypti (AeOctR) were functionally expressed in mammalian cells. The expression levels of these receptors were quantified using radioligand binding. The ability of octopamine and experimental compounds to active the G_q-PLC-IP_3-Ca^{2+} signaling pathway was assessed by measuring changes in intracellular calcium.

Results: Specific binding of a radioligand to cells transfected with mosquito OctR DNA confirmed the successful high expression of OctR protein from both genera of mosquitoes. Functional assays with the endogenous ligand octopamine showed the expressed receptors are truly octopamine receptors given the dose-response nature of the response and the ability of an OctR antagonist to block the response. High potency of octopamine at the receptors over tyramine confirmed these receptors as OctRs instead of closely related tyramine receptor. Robust G_q-PLC-IP_3-Ca^{2+} signaling responses indicate these receptors are G_q-coupled consistent with their identity specifically as α-like OctRs. These systems were used to begin to characterize novel experimental compounds, some of which act as potent OctR agonists.

Conclusions: In this study, we created cell lines stably expressing cloned mosquito OctRs and validated that the sequences code for bona fide α-like OctRs. Correlation of the agonistic effect of experimental compounds at these cloned mosquito OctR with protection against biting suggest that this molecular platform could serve as a useful biotechnology of discovering novel mosquito deterrents.

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