

Poster Number: 1

Category: Early Stage Investigator

Novel rTMS in Stroke and Depression (NoTSAD); A Pilot Study examining rTMS as a Treatment for Post-Stroke Depression in the Subacute Phase

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Post-stroke depression (PSD), affecting 50% of the 6.6 million stroke survivors, adversely influences outcomes yet strategies to prevent or reduce its incidence are limited. There is a critical need to develop novel treatments. Repetitive transcranial magnetic stimulation (rTMS) is effective in mitigating symptoms of depression in other patient populations.

The mechanism(s) responsible for its efficacy are unknown, however some preliminary data implicate immunomodulation. PSD may represent a unique immunological consequence of brain ischemia.

Methods: Open label design; participants will undergo an accelerated 4 day rTMS protocol. Inclusion: Patients with evidence of depression within 6 months of stroke onset. Exclusion: Patients with a history of severe psychiatric illness, epilepsy, active substance abuse, or contraindication to magnetic stimulation. Primary outcome: Safety and feasibility of this accelerated protocol in PSD patient population. Exploratory outcomes: (1) significant improvement on HAM-D scale, (2) decrease in successfully treated participants' Neutrophil: Lymphocyte Ratio (NLR).

Results: Actively recruiting. 1/5 patients completed protocol. No adverse events reported and depression score was reduced from 12 to 2. NLR 3.68 pre-rTMS and 3.16 post-rTMS.

Conclusion: WV patients with PSD can be successfully recruited for this trial and safely undergo this novel accelerated 4 day rTMS protocol in the subacute recovery period. Analysis of pilot data may support our hypotheses that rTMS is an effective treatment of PSD and that the mechanism behind such an effect is immune-mediated. We plan to use our pilot experience to set the stage for an RCT comparing active rTMS with sham stimulation in the PSD population.

Poster Number: 2

Category: Early Stage Investigator

A Crisis in the Classroom: Teachers and the West Virginia Opioid Epidemic

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West Virginia has the highest drug overdose rate in the country, and children whose parents struggle with substance use disorders bring neglect, trauma, and mental health issues into public schools. Our research team sought to understand teachers' experiences of the opioid epidemic among West Virginia public school classrooms via an online mixed methods survey. Our results are based on 2,205 West Virginia teachers across 49 counties and paint a grim picture of the challenges facing teachers.

Over 70% of teachers reported an increase in the impact the opioid crisis, but 90% do not feel confident in knowing how to support children with parents in active addiction. Despite this, 80% seek help from their colleagues, who likely are also unsure how to meet the needs of their students. Perhaps because of this, about 70% of teachers report feeling burnout on a monthly basis. One teacher remarked "I used to be energetic and love teaching kindergarten. Now I am fearful for what each school year brings."

Based on results from this survey, we identified a number of recommendations, drawing upon best practices in education, addiction studies, and child and family studies. Specifically, our results suggest the need for additional training on topics related to substance use (e.g., effects of addiction on family systems and children, classroom strategies, parent and family interaction strategies), increased support infrastructure for teachers (e.g., increased addiction-trained staff, mentorship opportunities where teachers can share effective strategies), and the provision of community-based resources to schools (e.g., local addiction services).

Poster Number: 3

Category: Early Stage Investigator

Psychometric Properties of NIH PROMIS Measures in Bariatric Surgery Candidates

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Objective: The goal of my WVCTSI funding is to build capacity to develop and test weight loss interventions for West Virginians with severe obesity. The objective of this study was to ascertain whether two widely-used outcome measures can be used in this population; the Patient-Reported Outcomes Measurement Information System (PROMIS) Depression (PROMIS-D) and Anxiety (PROMIS-A) Short Forms.

Methods: This retrospective chart review included (n=259) patients who completed a pre-surgical psychological evaluation comprising a semi-structured interview and self-report measures. Other data used included demographics, psychiatric diagnoses, and initial psychological clearance for surgery (yes/no). Reliability and validity of the PROMIS-D and PROMIS-A instruments was assessed using various methods, including Cronbach's alpha and correlations, logistic regressions, and generalized linear models, respectively, to determine whether PROMIS instruments were correlated with similar measures, predicted surgical clearance and psychiatric diagnosis, and whether psychiatric diagnosis status was associated with significantly different PROMIS scores. The factor structure and invariance were also assessed.

Results: Patients were mostly female (78%), white (97%) and middle-aged (M=43.49, SD=11.26). Rates of diagnosed anxiety and depression-related disorders were high, 17% and 23%. At least 65% of respondents reported "never" or "rarely" experiencing symptoms across both measures, and the mean T-scores for the PROMIS-A and PROMIS-D were 48.31 (SD=8.99) and 48.64 (SD=9.49), respectively. Both measures demonstrated good psychometric properties and were unidimensional.

Conclusions: Analyses supported using both PROMIS measures in this patient population.

Poster Number: 4

Category: Early Stage Investigator

QI/QA MedManage: A tool in Reporting Over-the-Counter Medication in a Rural West Virginia Primary Care Clinic

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Purpose:

The rates of chronic disease in West Virginia, such as hypertension, cancer, diabetes, chronic heart disease, and co-occurring health risk behaviors exceed those of the US overall.¹ Medication errors are identified as a significant contributing factor to readmissions. The goal of this project was to evaluate the over-the counter (OTC) meds taken by patients at the Robert C. Byrd Clinic by using a symptom driven tool called “Med Manage” for medication reconciliation.

Methods:

Patient records of two family medicine providers were assessed from November 2017-May 2018. During the intake process, patients’ medication lists were reviewed and reconciled with newly reported medications/supplements from the “Med Manage” tool. This data was extracted from patient records, using a specially designed audit sheet, and assessed for frequency, range, mean, and diversity.

Results:

117 patient records were assessed. Average patient age was 69 years old (range 67-72) and average time between visits was 2.5 months. Average “active meds” was 12 and “reported meds” (from previous visits) was 5. The “Med Manage” tool averaged 2 newly reported meds per visit.

When combined, OTC medication frequency for “pain” (43) exceeded that of all other categories with 24 noted as non-steroidal anti-inflammatories (NSAIDs).

Discussion:

A significant number of medications were obtained using the Med Manage tool that were not previously reported to the intake nurse. Omission of these medications may cause polypharmacy and adverse outcomes for the patients. Further data analysis to assess potential interactions for patients taking high risk medications, including pharmaceuticals already reported/prescribed, is needed.

Poster Number: 5

Category: Early Stage Investigator

Spatial Characterization of Inflammatory Cytokines in Septic vs. Aseptic Revision Knee Arthroplasty

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Disclosures: MJD: (3B- Heraeus Medical; 4- Synotrac/Graftworx; 9- AAOS Board or Committee Member, American Association of Hip and Knee Surgeons Board or Committee Member). NP, JM, JB: None.

Introduction: Failure rates for the treatment of prosthetic joint infection (PJI) after knee arthroplasty approach 50%. Management of these infections necessitates the need for surgical and systemic antibiotic treatments. Currently surgical treatments rely on the subjective expertise of the surgeon. The purpose of this study was to gain an objective understanding of spatial variability of tissue cytokine responses in patients undergoing total knee revisions (TKRs).

Methods: Patients undergoing TKR were enrolled after approval from our institutional review board. Patients labeled as septic met Musculoskeletal Infection Society Criteria and aseptic TKR patients were used as comparison. Tissue samples were collected across spatial gradients, primary and secondary debridements, from four locations within the knee. Tissues were analyzed using an Invitrogen human inflammatory cytokine 20-plex assay (Invitrogen, Carlsbad, CA). Tissues were compared spatially and between septic vs. aseptic patients using Two-way ANOVA with Bonferroni post-test.

Results: In the spatial characterization of human inflammatory cytokines from the multiplex panel, five displayed statistical significance based on superficial vs. deep locations: IL-8, MIP-1 α , P-Selectin, IL-1 α , and TNF- α were significant at $p < 0.05$ (N=6). Three cytokines were statistically significant for comparisons of septic vs. aseptic tissues: IL-8, IL-1 α , and P-Selectin were significant at $p < 0.05$ (N=6).

Discussion: This pilot study demonstrated that differences exist in cytokine response to discriminate spatially and based on presence of infection. It was possible to identify regional variability in tissue response. With this information new therapeutic strategies and infection-specific diagnostics that could improve outcomes for patients that suffer from PJI.

Poster Number: 6

Category: Early Stage Investigator

Associations between genetic or inducible B cell deficiency and depressive-like behavior in mice

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Major depressive disorder (MDD) is a debilitating mood disorder afflicting 20% of the population. That available pharmacotherapies exert delayed and often insufficient symptom alleviation suggests that the pathology of MDD is more complex than previously appreciated, neurotransmitters thought to underlie MDD-associated brain pathology may not be the sole contributors to its presentation, monoamine-based therapeutic interventions targeting these systems will remain inadequate at relieving symptoms or treating the underlying dysfunction, and novel treatments that modulate innovative targets are critically needed. As mounting evidence supports the complex interaction of the brain, endocrine, and immune system (IS), a plethora of findings implicate a pro-inflammatory state and T cell over-activation in MDD. Yet the impact of the B cell on affect is uncertain. We previously evaluated the impact of B cell deficiency on depressive-like behavior using male B6.129S2-Ighmtm1Cgn/J homozygous mice (aka μ MT^{-/-}) that lack mature B cells and have no membrane-bound IgM expression. Depressive-like behavior was assayed using the forced swim and sucrose preference tests. Compared to wild type mice, μ MT^{-/-} mice displayed an age-dependent depressive-like phenotype that was alleviated with typical antidepressant therapy (20mg/kg desipramine given i.p. 30 min prior to test) but was reversed via immune modulation (adoptive transfer of splenic CD19⁺ B cells), implicating a crucial role for these cells in MDD. Here, we utilized an antibody intervention to selectively deplete B cells in vivo to induce transient B cell deficiency in wild type mice and evaluated depressive-like behavioral and neurobiological endpoints. Findings from this pilot study will be presented.

Poster Number: 7

Category: Early Stage Investigator

Using a Patient-Engaged Approach to Modifying a Readiness to Change Survey for a Rural Appalachian Population

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Background: The modification of a readiness to change tool, previously validated in Italy, for use in an Appalachian population requires a high level of insight, understanding, and consideration of appropriate research methods. A pilot administration of the TRE-MORE (TReatment, MOtivation and REadiness) test to a random sample of 235 patients at 16 family medicine clinics in West Virginia highlighted the need for locally relevant revisions.

Objective: The objective of this study is to engaging community stakeholders to modify an existing validated tool for cultural relevance.

Methods: This study is a qualitative research study utilizing focus groups. Focus groups were held in 4 rural West Virginia clinics. Goal focus group enrollment included two clinic staff including one physician and three adult patients with a BMI over 30. The focus groups were audio-recorded and transcribed for analysis. A total of 11 patient participants and 9 clinical staff took part in the focus groups.

Results: Participants provided culturally relevant suggestions for adjusting the TRE-MORE survey including 1) improving the print size, 2) add specific food categories that are not included such as process foods and soda, 3) replace previous wording with culturally relevant terms and 4) addition of questions regarding influence of social relationships on health to emphasize importance.

Conclusions: This study resulted in important feedback to modify the existing TRE-MORE test with cultural relevance for administration in rural West Virginia primary care clinics. This feedback will be used for future study design to validate the survey in rural West Virginia.

Poster Number: 8

Category: Early Stage Investigator

The Feasibility and Ability of Universal Suicide Risk Screening to Increase Suicide Risk Detection Rates in West Virginia Primary Care: A Pilot Test of the Ask Suicide-Screening Questions (ASQ) Toolkit

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In 2017, West Virginia had the 8th highest suicide mortality rate in the U.S. (21.1 vs. 14.5 per 100,000 in the general population). The present study evaluated the feasibility of an electronic universal suicide risk screening program in rural primary care using the Ask Suicide-Screening Questions (ASQ) Toolkit developed by National Institute of Mental Health (NIMH). Adult patients at a rural primary care clinic were asked to complete the ASQ screener as a routine part of their primary care visit; patients who screened positive were evaluated further for suicide risk by their provider using the ASQ Brief Suicide Safety Assessment (BSSA). Suicide screening and detection of risk were compared between two-time periods: baseline and implementation of the intervention. Of the 335 patients who were approached, 64.2% (N = 215) agreed to watch a consent video explaining the study, and of these, 89.7% (N = 193) agreed participate. The majority (95.9%; N = 185) of participants agreed that primary care providers should screen for suicide risk during primary care visits. The proportion of all patients who were screened for suicide was significantly higher after the implementation of the ASQ toolkit (57.6%) compared to baseline screening data (5.8%; $p < .001$). The suicide risk detection rate was also significantly higher during the intervention phase (10.4%) compared to the baseline phase (0.7%; $p < .001$). Despite the increase in detection rates, clinic flow was not negatively impacted. These preliminary data support continued evaluation of universal suicide risk screening programs in rural primary care.

Poster Number: 9

Category: Early Stage Investigator

Outcomes from a Prospective Phase II Clinical Trial Evaluating Systemic (Abscopal) Response from the Addition of Local Radiation to Standard of Care Immunotherapy in Patients with Metastatic Non-Small Cell Lung Cancer (NSCLC)

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This is an initial report of a prospective phase II clinical trial evaluating the systemic efficacy of combined radiation and immunotherapy for metastatic NSCLC. Thirty-four patients were enrolled and received standard-of-care checkpoint inhibitor immunotherapy alone (56%) or with concurrent chemotherapy (44%), plus 3-5 fractions of radiation therapy to a single extra-cranial target lesion. The primary endpoint was best systemic objective response rate (ORR) using iRECIST criteria, excluding irradiated lesions. Secondary endpoints included progression free survival (PFS), overall survival (OS), time-to-progression (TTP), and toxicity. Median follow-up was 7 months. The systemic ORR was 42% (32% also had stable disease). Higher pre-treatment cytotoxic T-cells and lower regulatory T-cells were associated with improved ORR ($p < 0.05$). Median-OS was 12 months, median-TTP 8.5 months, and median-PFS 6.1 months. PD-L1 $>50\%$ (vs. $<50\%$) and RT to primary tumor (vs. metastasis) were associated with significantly longer TTP and PFS ($p < 0.05$). The use of chemotherapy, higher BED, and size of tumor irradiated did not impact TTP or PFS. There were no grade 3 or higher toxicities related to the RT. These compare favorably to historical standards. RT may be particularly useful for patients who are not candidates for chemotherapy and when the primary tumor is amenable to RT. Peripheral blood leukocyte counts may also be a useful predictive biomarker for systemic response

Poster Number: 10

Category: Early Stage Investigator

Associations between Prescription Drug Monitoring Program Features and Trends in Prescription and Illicit-Opioid Related Poisonings

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Background:

States have responded to the ongoing opioid crisis by implementing prescription drug monitoring programs (PDMPs). Some anecdotal evidence suggests that PDMPs may be associated with increasing rates of illicit opioid-related poisonings (IORPs). This study sought to examine associations between specific features of PDMPs and changes in PORP and IORP rates over time.

Methods:

This longitudinal observational study examined associations between PDMP features and trends in PORP and IORP rates from 2004 – 2014. Administrative health claims data were used to identify inpatient hospital admissions and emergency department visits related to PORPs and IORPs. Generalized estimating equation Poisson regression models were used to examine whether specific PDMP features are associated with trends in rates of PORP or IORP over time. Models were adjusted for relevant demographic and clinical characteristics of the population examined over this time period

Results

In adjusted analyses, states without PDMPs experienced significantly greater increases in PORP rates relative to states with operational PDMPs in place. Certain PDMP features were associated with significant protective effects on increases in PORP rates over time. States with operational PDMPs with unsolicited reporting requirements were associated with significantly greater increases in IORP rates relative to states with PDMPs that lacked this feature.

Conclusions:

Once implemented, PDMPs appear to exert a protective effect on increasing PORP rates relative to states without PDMPs in place. Further, the magnitude of this protective effect may be dependent on PDMPs having certain features in place. Additional research is needed to better understand the relationship between PDMP implementation and trends in IORPs.

Poster Number: 11

Category: Early Stage Investigator

Nursing Students Assist in the Measurement of Obstructive Pulmonary Disease Using Spirometry, Plethysmography and Aerosol Dispersion Techniques

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Aerosol Spirometry (AS) is being newly commercialized to provide pulmonary patients with an alternative to flow-volume spirometry (FVS) that is easier to perform and simpler to administer. To demonstrate the simplicity of performance, nursing students administered the AS and compared the results to FVS done by a trained technician in a clinical laboratory. The AS does not require a forced exhalation maneuver. Students needed only to coach the patients to breathe an expected volume, approximately. Therefore, training only required that the nursing students maintain the patient in a calm state and explain that the patient should follow a volume indicator to achieve the desired inhalation volume. Pulmonary function results from AS have previously been shown to be independent of breathing rate as well as personal characteristics of the patient such as gender, age and height.

Approximately 100 patients with physician-diagnosed asthma were tested. The patients were coached by the students for five consecutive breaths. The patients were then allowed to continue breathing as they had been instructed but with no further coaching for an additional five breaths. Results for the two different sets of breaths were analyzed separately and compared.

Comparison of the AS with FVS shows a level of correlation equivalent to that seen previously in other trials by experienced investigators. Not only were the nursing students able to achieve that level of performance with their patients, but the patients, themselves, showed no significant difference in their AS results, doing the test without coaching.

Poster Number: 12

Category: Early Stage Investigator

Strategies to investigate the long-term effects of neonatal abstinence syndrome on brain development

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Neonatal abstinence syndrome (NAS) has become a major health concern in the United States and Central Appalachia in particular as a result of the widespread opioid epidemic. Recently, Marshall University physicians have noted a specific clinical presentation of NAS in infants prenatally exposed to opioids and gabapentin, a drug commonly given for the treatment of pain and seizure. Interestingly, gabapentin is also known to inhibit the development of the synaptic pathways in the brain by interfering with signaling proteins (i.e. thrombospondins) derived from non-neuronal brain cells called astrocytes. We hypothesize that the progression of NAS is dependent on impaired synaptic development in the developing brain.

We are currently studying long-term changes in synaptic connectivity following prenatal exposure to drugs of abuse in two primary approaches: 1) We have developed a mouse model of NAS using either wild-type C57/Bl6 mice or mice transgenic for the thrombospondin/gabapentin receptor, $\alpha 2\delta$ -1, so that the effects of co-abuse of the opiate buprenorphine and gabapentin on synaptic development can be examined. 2) We are optimizing the culture of cerebral organoids, three-dimensional structures that recapitulate many aspects of human brain development. These organoids can be grown from induced pluripotent stem cells (iPSCs) derived from umbilical cord blood. We will acquire cord blood from infants born to mothers enrolled in the program for Medication-Assisted Treatment for substance abuse. Organoids from this patient population will provide a unique opportunity to study the influence of NAS on long-term human brain development.

Poster Number: 13

Category: Early Stage Investigator

Understanding the Trajectory of Astrocyte-Synaptic Coupling During Development and Following Ethanol Exposure in Rat Model of Adolescent Binge Drinking

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Frequently overlooked due to the opioid epidemic, alcohol use continues to be the most commonly used and abused substance in Appalachia and the primary reason for seeking substance abuse treatment in this region. Early-life binge drinking correlates with increased likelihood of developing an alcohol use disorder (AUD); however, underlying mechanisms are not well understood. Using an adolescent rat binge drinking model (AIE), we have demonstrated that AIE induces neuronal synaptic remodeling; however, little is known about the contribution of non-neuronal glial cells called astrocytes, which are critically involved in synaptic remodeling and ensheath neuronal synapses (i.e., astrocyte-synaptic coupling). Disrupting astrocyte-synaptic coupling could compromise astrocyte regulation of synaptic function and stability. However, not much is known about how/when astrocyte-synaptic coupling occurs during development and consequences of AIE.

To address these questions we utilized an astrocyte-specific viral labeling approach with high-resolution single-cell astrocyte imaging in rats to understand the nuances of astrocyte-synaptic coupling across development and determine whether AIE promotes decoupling.

We show that astrocytic processes continue to undergo significant refinement throughout adolescence and well into adulthood, and that this is disrupted into adulthood following AIE exposure.

Compromise of appropriate astrocyte ensheathment of synapses could have profound effects on synaptic function and contribute to the persistent changes in cognition previously observed. These data further our understanding of glia-neuronal interactions that could be pivotal in understanding the neuronal remodeling that occurs during the development of addiction and may provide a novel non-neuronal therapeutic target for the treatment of AUD.

Poster Number: 14

Category: Early Stage Investigator

Burnout Syndrome among West Virginia Trauma Practitioners

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Burnout Syndrome (BOS) is a commonly recognized barrier in maintaining a healthy work environment. Burnout rates have been reported to approach 50% in studied disciplines within healthcare. There is limited data evaluating BOS in trauma practitioners; however, factors such as patient acuity, unpredictability of workload, exposure to events of abuse, or violent crimes may potentiate the risk for BOS in trauma practitioners.

An anonymous, cross-sectional survey was conducted with West Virginia (WV) trauma practitioners. The survey was divided into 3 sections: demographics, the Mini Z burnout survey, and supportive infrastructure.

The overall BOS rate was 30.9% in WV trauma practitioners. Practitioners who reported BOS were significantly less likely to be satisfied with their job; had satisfactory control over workload; had high value alignment with employer leadership; had a team that worked efficiently together; and had adequate time for documentation. A higher percentage of BOS practitioners reported a great deal of job-related stress; chaos in the primary work area; and too much time on EHR at home. Almost all the respondents acknowledged the importance BOS for practitioners' well-being and as a potential barrier to patient care. Around one-third of practitioners with BOS were aware of supportive programs, and only 5.3% claimed to have programs readily available to them.

Approximately one-third of the surveyed WV trauma practitioners reported experiencing BOS. Practitioners reported that there was minimal infrastructure available to identify and support those experiencing BOS. Accordingly, results from this study identified several areas in which interventions may be targeted moving forward.

Poster Number: 15

Category: Early Stage Investigator

Use of Seva Acupressure to Reduce Stress and increase wellbeing of inpatients being treated for Opioid Addiction: A Feasibility Study

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Introduction: Acupressure has been used to treat a variety of symptoms, including stress. The Seva acupressure protocol is documented in the literature as reducing stress, pain, and fatigue and promoting wellbeing. Patients undergoing treatment for opioid addiction experience high levels of stress, potentially impacting their treatment persistence and relapse. Seva acupressure might assist in reducing stress and increasing perceived wellbeing among these patients; however, no studies have been conducted using Seva with this population. This study's purpose is to explore the feasibility of use of Seva Acupressure with patients being treated for opioid addiction, and to provide beginning evidence for its impact on patient stress and wellbeing.

Methods: Thirty patients are being recruited as study participants from a local treatment facility. After providing consent, participants complete the "State" component of the State-Trait Anxiety Inventory (STAI), provide demographic data, and rate their pain, stress, and fatigue on a 0-10 scale. After receiving Seva, patients again rate their pain, stress, and fatigue, and the helpfulness of acupressure in reducing these symptoms. Patients receive Seva twice during hospitalization, followed by a survey asking about their experience receiving Seva and another STAI questionnaire. At the study conclusion, research personnel and facility employees will be asked to evaluate the feasibility of incorporating Seva acupressure into the treatment plan for patients undergoing opioid addiction treatment.

Findings: Although data collection is ongoing, patient responses to Seva acupressure are very favorable. All reported less stress, pain and fatigue after Seva, improved sleep between Seva sessions, and generally improved mood.

Poster Number: 16

Category: Early Stage Investigator

Personality Characteristics Predict Changes in Alcohol Use and Depression Levels During the Transition to College

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The transition to college is a key developmental transition in lives of emerging adults. Students are exposed to new life-stressors that can contribute to mental health challenges and health compromising behaviors. Identifying the factors predicting students' adjustment during this college transition can help to develop targeted prevention programs aimed to foster resilience by strengthening mental health and reducing substance abuse. This prospective longitudinal study explored how personality characteristics predicted change in two risk factors that can increase during the college transition: depression and problematic alcohol use patterns. Our sample consisted of 580 participants (aged 18-20) measured 5 times during their freshman year at West Virginia University. Personality was assessed with BFI-2 (neuroticism, conscientiousness, extraversion, openness, and agreeableness) and depression via the CES-D. Alcohol consumption was assessed with the question "In the past 30 days, how many alcoholic drinks did you have on a typical day when you drank alcohol?". A series of latent growth curve models provided evidence that both average alcohol use and depression levels significantly increased over time (alcohol = .57, $p < .05$; depression = .58, $p < .05$) with a slight decrease towards the end of the first-year of college (alcohol = -.031, $p < .05$; depression = -.005, $p < .05$). Lower levels of conscientiousness at baseline predicted greater depression and alcohol use, and steeper increases over the first year of college. Findings underscore the role of personality assessment to identify those at-risk for depression and alcohol problems during their first year of college.

Poster Number: 17

Category: Early Stage Investigator

Effectiveness of a Physical Activity Intervention on West Virginia Student Participants with Asthma, Diabetes, or other PA Limiting Medical Conditions and/or Family History of Diabetes, Cardiovascular Disease, or other PA Limiting Conditions

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Introduction

West Virginia's (WV) current obesity rate for 10-17 years old is 20.3% and children with Physical Activity (PA) limitations are twice as likely to be overweight.

Activate! was developed to test the effectiveness of school and family-based interventions' influence on daily PA minutes. The purpose of this study was to compare intervention effectiveness overall as well as for select proportions of the sample.

Method

Children (10-12 years) enrolled in schools from the Mid-Ohio Valley region of WV were eligible to participate. Baseline and post surveys from children/parents assessed child/parent limitations to PA including family medical history. Child PA: an average for weekday and weekend per parent report in minutes. Effectiveness of the intervention: compared weekday and weekend average minutes of PA across three arms using a MANOVA. Model covariates: family history and medical limitations – dichotomized with "0"-no/"1"-present.

Findings

Six hundred ninety-six parent-child dyads provided complete information for this study; schools were randomized and participant dyads by arm included: 264-control, 219-school, and 213-family. Children's average PA significantly differed: medical limitations reported ($p < .05$) and family history of either diabetes or cardiovascular disease ($p < .02$). After controlling for limitations/family history, we found a significant difference in children's average weekday PA activity outside of school based on intervention arm ($p < .05$): control 84.5 minutes/week, school 85.5 minutes/week, and family 101.7 minutes/week.

Implications

Medical limitations and family history of disease significantly impacted reported weekday PA for children. After controlling for these differences, Activate! interventions were effective in increasing PA among children overall.

Poster Number: 18

Category: Senior Investigator

Dissemination of a Sustainable Model for Community Health Worker-Based Chronic Care Management

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PURPOSE

This session will describe the dissemination and outcomes of a model for chronic care management of high-utilizer patients that includes community health workers (CHW) on the team. The top 5% of high-utilizer patients account for 50% of health care dollars.

INTERVENTION

The model is replicated by 13 health centers in 22 rural Kentucky, Ohio, and West Virginia counties. The chronic care management team is comprised of a mid-level health care provider, a nurse, and community health workers (CHW). It conducts weekly assessments of patients' health status and manages care plans. The CHWs link patients with community services and conduct regular home visits. The CHWs receive instructions from the clinical staff and are health center employees.

The long term goal is to establish a payment model that equitably shares the savings from our model. We have engaged five health insurance payers in WV and two in Ohio, in a process of monitoring outcomes and documenting cost savings.

RESULTS

A total of 28 CHWs employed by the health centers; 504 high-utilizer patients enrolled; the A1C of diabetes patients decreased from 9.7% at baseline to 8.6% after six to 12 months, 70% of whom lowered their A1C. One payer has signed a MOU to collaborate on establishing a payment model. Two others are in the process of doing so.

CONCLUSION

The high proportion of patients that have lowered their A1C holds the prospect of a rapid return on investment, which is an incentive for payers to collaborate on establishing a payment model.

Poster Number: 19

Category: Senior Investigator

Translating Evidence into Practice: A Telehealth Case Study

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Background: Telehealth interventions offer an evidenced-based approach to providing care, education, and timely communication at a distance in addition to linking dispersed healthcare teams. Yet, the widespread use of telehealth in practice has not reached full potential. The complexity involved in implementation often presents challenges in translating evidence into clinical practice. The objective of the presentation is to describe a process of translating evidence into practice for greatest effectiveness, sustainability, and scalability. The case study presented will describe the design of a telehealth implementation project to prevent re-institutionalization in the state of West Virginia.

Methods: Guided by the Model for Developing Complex Interventions, 10 meetings with a design team comprised of telehealth experts and state stakeholders were held. Each step in the model was used to build and inform the intervention. The steps include: problem identification, practice analysis, objective identification, identification of key principles, building and planning, modelling and seeking expert review, and developing the protocol.

Results: The intervention is intended to be funded by the involved state stakeholders and targets participants who are transitioning into their communities electing telehealth services at discharge. At the conclusion of the meetings, the implementation protocol was complete. Cost, clinical effectiveness, and satisfaction will be evaluated to inform future iterations of the intervention.

Conclusions: A theory-driven approach facilitated the successful development of a pilot demonstration intervention. This demonstration will provide critical information to promote scalability of telehealth services to other home and community-based services within West Virginia. The process and pitfalls will be discussed.

Poster Number: 20

Category: Senior Investigator

Using an Implementation Research Framework to Identify Facilitators and Barriers to Physical Activity and Weight Loss in Appalachia

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The state of West Virginia has the highest adult obesity rate in the US as well as one of the highest physical inactivity rates. The link between obesity and a lack of physical activity is well documented but it is important to understand the situational factors and personal characteristics in play and how these factors influence people's behavior in regards to weight loss and exercise. The Consolidated Framework for Implementation Research (CFIR) is an approach for designing and evaluating implementation strategies and integrates 5 domains that may include barriers and facilitators to weight loss and exercise in WV. Secondary qualitative analysis of transcripts from 4 focus groups interviews conducted across the state (consisting of healthcare providers and patients) was conducted using the CFIR to code local successes and challenges experienced by participants and the relationship to exercise, diet and weight loss. Results identify barriers and facilitators across all 5 major domains of the CFIR, including intervention characteristics, inner setting (such as access to knowledge), outer setting (such as cultural norms and infrastructure), characteristics of individuals, and the implementation process. A comprehensive implementation framework for promoting healthy diet and exercise options may increase participation in a culturally unique and extensively rural areas such as WV. This study suggests that the CFIR can be used to guide clinicians in planning implementation of new approaches to increase physical activity and healthy eating for their patients.

Poster Number: 21

Category: Senior Investigator

Evaluation of Guided Imagery Delivered Through a Mobile Health Application to Address Multiple Health Behaviors With Pregnant Women

Peter Giacobbi, Jr.,¹ Ph.D., Treah Haggerty, MD.,¹ Stanislav Pidhorskyi, M.S.,¹ Danielle Symons-Downs, Ph.D.,² Leann Long, Ph.D.,³ Dana Volker, Ph.D.,¹ Melanie Clemmer, Ph.D.,¹ Melissa D. Olfert, DrPH, RDN.,¹ Shari Steinmann, Ph.D.,¹ Neel Rao, Hannah Staggs,¹ Kelsey Kinnamon,¹ Thomas Hulsey, Ph.D.,¹ & Donald Adjero, Ph.D.¹

West Virginia University,¹; Penn State University,²; University of Alabama at Birmingham³

Pregnancy is associated with physical and psychological challenges including excess weight gain, sleep disturbances, discomfort/pain, reduced psychological well-being, and low physical activity or predominately sedentary behavior. Guided imagery (GI), similar to mindful meditation, is a mind-body technique involving visualization of mental images and it has shown promising results with reducing health challenges experienced by pregnant women. The purposes of this 6-week, within-subjects, feasibility trial were to test the use, acceptance, and outcomes of a guided imagery intervention delivered through a mobile health (mHealth) application, called Pregpal, that targeted physical activity, food cravings, and mental health among pregnant women. Guided imagery audio files were co-developed with pregnant women using a cognitive-motivational theoretical framework. Recruitment occurred locally in clinics and nationally through social media. Participants were instructed to listen to the audio files focused on sleep/relaxation, connection to the baby, physical activity, eating healthy, and body image. Data from 58 enrolled participants (MAge = 28.5, pre-pregnancy BMI = 27.6) showed an average of 4.96 audio downloads per week. Results of Wilcoxon signed rank tests of study completers showed significant reductions in depression, anxiety, and stress ($\Delta = 2.02$, $p = 0.0007$), sedentary behavior ($\Delta = 10.39$ minutes, $p = .0236$), preoccupation with complexion ($\Delta = .32$, $p = 0.0437$), and increased sexual attractiveness ($\Delta = 0.40$, $p = 0.0148$). Cloud data usage, changes in the measured outcomes, and results from qualitative interviews provide support for the continued testing of the Pregpal multi-behavior mHealth application.

Poster Number: 22

Category: Senior Investigator

Dental and Medical CE requirements across the United States: Infection Control and CPR/BSL

R. Constance Wiener, Dental Practice and Rural Health; Ruchi Bhandari, Epidemiology; Christopher Waters, Dental Research; Alcinda Shockey, Dental Hygiene; Fotinos Panagakos, Dental Research

Introduction: Continuing education (CE) provided through interprofessional (IP) education has been an effective manner in which individuals from differing professions have gathered to learn about specific topics. Differing accrediting agencies have provided CE or CME certification for such efforts. Infection control and life support are topics which lend themselves to interprofessional education. However, some programs are only utilized if mandated by governing boards. The purpose of this research was to determine regional differences in CE requirements for infection control and CPR/BSL for dentists, dental hygienists, and physicians.

Methods: Data were extracted from dental law board and medical law board websites in December, 2018 and January, 2019.

Results: Infection control CE for dentists and dental hygienists is required in: AR, AZ, CA, CT, DC, DE, IA, MD, MN, ND, NH, NV, OR, RI, SC, WV. Additionally, OH and NY require it for dental hygienists. CT and NY require it for physicians. No requirements for CPR/BSL are listed for dentists in CO, KS, KY, MA, MT, NE, NM, OH, OR, PA, RI, SC, TX, UT (VT lists a requirement for emergency office procedures). For dental hygiene, the list includes CO, ID, KS, KY, MA, MS, MT, NE, NM, OH, OR, PA, RI, SC, TX, UT (VT lists a requirement for emergency office procedures).

Conclusions: Rocky Mountain states were less likely to require infection control CE and CPR/BSL CE for dentists and dental hygienists. Only CT and NY had specific requirements for physician CE in infection control.

Poster Number: 23

Category: Student/Resident/Fellow

Vaping during pregnancy impairs central and peripheral vascular reactivity in offspring

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Introduction: Pregnant women smokers are likely to initiate Ecig use as a misguidedly safer alternative to smoking. However, effects of vaping on offspring are unknown. Here, we evaluate effects of *in utero* Ecig exposure on vascular function in central and peripheral vascular beds.

Methods: Sprague-Dawley rat dams were exposed to either nicotine-free Ecig vapor (Ecig0, Joyetech eGrip OLED using 5-sec puffs @17.5 W) or ambient air. Maternal exposure started on gestational day 2 and continued until pups were weaned (postnatal day 21). 2-millimeter segments of thoracic aorta were obtained from 3-month old pups (Ecig0, n=8; Air, n=8) and mounted on a wire myograph system (DMT, AD Instruments). Vessels were pre-constricted with U46619 (10^{-8} M) and exposed to increasing concentrations of methacholine (Mch; 10^{-9} M to 10^{-4} M) to assess endothelial-dependent relaxation. Similarly, middle cerebral arteries (MCA) were isolated and positioned in a pressurized myobath and exposed to increasing concentrations of acetylcholine (Ach; 10^{-9} M to 10^{-4} M).

Results: Significant impairment in aortic relaxation was observed in Ecig0 pups vs Air pups ($69\pm 19\%$ vs $93\pm 11\%$, respectively, $p < 0.05$). MCA dilation was also significantly impaired in Ecig0 vs Air group ($8\pm 1\%$ vs $23\pm 2\%$, respectively, $p < 0.05$).

Discussion: Offspring born to mothers exposed to nicotine-free Ecig vapor during pregnancy have impaired vascular reactivity in aorta and cerebral vessels. This suggests vaping while pregnant results in adverse cardiovascular function. Clinicians and policy-makers need to be aware of these risks to discourage pregnant women from using Ecigs as a quit strategy.

Poster Number: 24

Category: Student/Resident/Fellow

Survey Analysis of Vaccinations in Pediatric Sub-specialty Clinics

Kiana Bullett, Department of Medicine, West Virginia University

The purpose of the study is to evaluate with three surveys whether there are missed opportunities to give vaccinations in the pediatric sub-specialty clinics in the Physician Office Center (POC) in Ruby Memorial Hospital. Many children are seen by pediatric subspecialists; however, with the exception of influenza vaccine, children rarely receive other vaccines in the pediatric sub-specialty clinics. Vaccination coverage among children aged 19-35 months for a combined 7-vaccine series in West Virginia in 2017 was 74.7%; rates for completion among children enrolled in kindergarten in 2017 WV was 98.4%; vaccination coverage among adolescents aged 13-17 years in WV in 2015 was 85.6% for 4-vaccine series required for school but only 39.2% and 27.1% for human papilloma virus vaccine, female and male respectively. Standing orders are an option for nursing staff to give missing vaccines for an established patient, if he/she is identified as deficient, without the need for a physician visit. Preliminary results reveal that most physicians, nurse practitioners, and nursing staff provide influenza vaccines to patients; 57% of them feel that enough vaccines are given in clinic. Nursing staff review vaccines during 33% of visits; 83% feel that standing orders should be enacted into clinic. The parents said that 83% were asked by care providers if their child's vaccinations were up-to-date and all parents indicated their child's vaccinations were up-to-date. Parental surveys also highlighted that 92% of children receive vaccines at a primary care provider office near home. These results are preliminary; surveys are continuing to be conducted.

Poster Number: 25

Category: Senior Investigator

Hedonic and Eudaimonic Motives Uniquely Predict Substance Use During the Transition to College

K. L. DeLong, Psychology Department, West Virginia University; A. L. Gentzler, Psychology Department, West Virginia University; N. A. Turiano, Psychology Department, West Virginia University

Hedonia (e.g., seeking pleasure) and eudaimonia (e.g., seeking purpose) are important components of wellbeing. However, excessive focus on hedonia may contribute to a greater risk of substance use. Focusing on hedonia may be especially detrimental during the college transition when adolescents gain newfound independence. In a sample of 580 incoming freshmen, we examined how hedonic and eudaimonic motives (assessed before starting college) were associated with substance use. A negative binomial regression indicated that hedonic motives were associated with using a greater number of substances prior to college ($EXP(B) = 1.17$; $p = .001$), whereas eudaimonic motives were associated with using fewer substances ($EXP(B) = 0.84$; $p = .001$). Logistic regressions confirmed the same pattern for the three most commonly used substances wherein hedonic motives predicted greater likelihood of using alcohol, tobacco, and cannabis before college, and eudaimonic motives predicted a decreased likelihood ($ps < .005$). When predicting substance use across their first year, a multinomial logistic regression indicated that increases in hedonic motives predicted increased odds of being a new user, quitter, or continual user of any substance by the end of their first year of college, versus individuals who never used any substance ($OR = 1.55 - 2.02$; $ps < .005$). Conversely, greater eudaimonic motives predicted reduced odds of being a new user, quitter, or continual user of any substance ($OR = 0.51 - 0.70$; $ps < .01$). Overall, these findings can be applied to inform intervention and prevention programs during the transition to college.

Poster Number: 26

Category: Student/Resident/Fellow

MTI-101 Treatment Induces Continuous Activation of SOCEs Leading to Necrosis in Multiple Myeloma

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Multiple Myeloma (MM) is a disease characterized by neoplastic proliferation of plasma cells in the bone marrow. Most newly diagnosed MM patients will respond to the currently available treatments. However, despite initial response all patients will eventually relapse with drug refractory disease. Clinical data continues to indicate that novel therapeutic strategies for the treatment of refractory myeloma are required to improve patient outcomes. MTI-101 is a novel agent that induces caspase independent cell death. Death induced by MTI-101 correlates with a robust increase in intracellular Ca²⁺ levels leading to necrosis. We previously showed that MTI-101 induced cell death is partially dependent on TRPC1 which is a component of the store operated calcium channels (SOCE). In this study we sought to delineate the difference between MTI-101 and known activators of SOCE (ex. Thapsigargin), and characterizing the binding partners inactive SOCE in response to MTI-101. Our data indicate that treatment with thapsigargin induces high peak levels of intracellular Ca²⁺ while treatment of MTI-101 induces a more sustained increase in intracellular Ca²⁺ levels. Importantly, thapsigargin treatment do not result in cell death following Ca²⁺ flux. We hypothesize that knocking down EB1 (Stim1 anchor protein in the ER) would disrupt Stim1 puncta formation and trafficking to the ER-PM junction following MTI-101 treatment. Preliminary data is showing a decreased cell death in response to EB1 knockdown with decreased intracellular Ca²⁺ flux.

Future direction includes characterizing the binding partners in active SOCE in response to MTI-101, and investigate the causes of MTI-101 continuous activation of SOCE.

Poster Number: 27

Category: Student/Resident/Fellow

mWRAPPED - Testing the Usability and Acceptability of a Weight Management Application in a Clinical Setting

Kristin Grogg, MPH, PhD Student, Clinical and Translational Science Doctoral Program, School of Medicine, West Virginia University; Nicholas Turiano, PhD, Department of Psychology, Eberly College of Arts and Sciences, West Virginia University; Peter Giacobbi, PhD, School of Public Health and College of Physical Activity and Sports Sciences, West Virginia University; Treah Haggerty, MD, Department of Family Medicine, School of Medicine, West Virginia University

Obesity is a leading public health concern in the US, with WV surpassing the national averages of physically unhealthy days, obesity, and physical inactivity in 2017. Unfortunately prior studies found that physicians are ineffectively identifying and intervening with overweight/obese patients. There are several reasons for this including; lack of time, training and reimbursement along with a feeling that the responsibility does not land on the primary care provider. Moreover, patients often fail to address this concern with their providers due to lack of awareness, discomfort, and lack of knowledge about and confidence with making necessary changes. Patient activation promotes self-directed behavioral changes through a patient-provider collaborative environment centered on patient health. The purpose of this study was to test the usability and acceptability of a patient activation application for use in clinic during wait times. This analysis was conducted to identify any demographic or prior technology use variables that would predict ratings of the applications acceptability or usability. Acceptability was measured by the overall rating of the application's user friendliness, while the System Usability Scale was used to assess usability. Both ratings were positive among all participants. A series of bivariate correlations and multiple linear regression models revealed that none of the demographic or prior technology use variables were significantly associated with either outcome. Findings suggest the application was easy to use regardless of any differences in user characteristics such as age, body mass, health or prior technology use. This application has potential for widespread uptake by clinics around WV.

Poster Number: 28

Category: Student/Resident/Fellow

Demographic and Addiction Exposure of Patients treated for Substance Use Disorder in the Comprehensive Opioid Treatment Clinic (COAT)

Krystal Hughes, WVU School of Pharmacy; Dr. Vince Setola, - Physiology and Pharmacology; Dr. David Siderovski -Physiology and Pharmacology; Ms. Laura Lander - Behavioral medicine and Psychiatry; Dr. James Barry - Behavioral medicine and Psychiatry; Megan Russell – Biology; Mai Do – PharmD; Dr. Marina Galvez-Peralta- Pharmaceutical Sciences

Illicit opioid use in Appalachia has reached epidemic proportions due to a variety of factors including the lack of evidence based treatment options for patients as well as numerous deleterious social determinants of health. West Virginia, in particular, has the highest rate of opioid drug overdoses in the nation, which is one of the largest health disparities afflicting the state. Suboxone® (buprenorphine/naloxone) is a medication assisted treatment which is recognized as a management option for opioid dependence. While Suboxone is widely used at the Chestnut Ridge COAT clinic, the therapy is not always successful which lead us to investigate possible causes for non-responsiveness to the treatment. Our work, with the Comprehensive Opioid Addiction Treatment clinic, is analyzing the demographics as well as addiction exposures of the patients enrolled in the clinic's treatment plan in order to differentiate differences among patients who responded verses those who were non-responders to the buprenorphine treatment protocol. We are looking at the differences between patients who have both suffered from recurrences, non-responders, in the weekly treatment groups (this also includes patients just starting the program); as well as patients in a monthly group who have successfully responded to the treatment without suffering from recurrences for more than 1 year. Demographic data we are looking at includes, gender, age of first exposure, concurrent medication use, as well as education level.

Poster Number: 29

Category: Student/Resident/Fellow

The Effect of Heparin Administration on In-Hospital Mortality in Patients with Aortic Dissection.

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OBJECTIVES: Aortic Dissection (AD) and Acute Coronary Syndrome (ACS) have overlapping symptomatology that make differentiating them difficult. This sometimes results in patients with AD inadvertently receiving anticoagulation. The aim of this study was to determine if the administration of heparin to patients with AD increased in-hospital mortality.

METHODS: A retrospective chart review of patients with AD admitted to a large academic hospital between 2010 and 2015 was performed. Patients with the diagnosis of type-A AD or type-B AD who were greater than or equal to 18 yo were included. Exclusion criteria consisted of trauma, thrombolytic administration, and history of anticoagulant use. The in-hospital mortality of patients who received anticoagulation was compared to those who did not.

RESULTS: A total of 131 patients were eligible for the study. 36 (27%) of the 131 patients received heparin; comorbidities including Hypertension, Diabetes, and Hyperlipidemia were also studied. In-hospital mortality was found to be 9-times higher in patients with type-A AD who received heparin compared to the non-heparin group. Patients with a diagnosis of type-B AD who received heparin had a negative statistically non-significant correlation with mortality.

CONCLUSION: Patients with type-A AD who receive heparin are 9-times more likely to have in-hospital mortality than those who did not. This study advises a cautious utilization of anticoagulants in acute, undifferentiated chest pain in the emergency department. Although, patients with type-B AD who receive heparin showed lower in-hospital mortality compared with those who didn't received Heparin, our data wasn't powerful enough to show statistically significant outcome.

Poster Number: 30

Category: Student/Resident/Fellow

Accessible Design in Rural West Virginia Outpatient Healthcare

J.E. Miller, Davis College of Design, West Virginia University

The Americans with Disabilities Act became law in 1990; since then research has shown that people with disabilities continue to experience environmental, systematic, and structural barriers to health care. The purpose of this research is to better understand the physical and environmental features of outpatient healthcare facilities that act as barriers to healthcare access in rural West Virginia and factors that contribute to non-compliance with the ADA. The research specifically aims to explore how usable rural health clinics are in rural West Virginia, which barriers are most prevalent, and the relationship between building characteristics and accessibility. The researcher evaluated ten rural outpatient member-sites of the West Virginia Practice-Based Research Network using a survey to understand building characteristics and a tool to measure essential features for a facility to be considered 'usable'. Expected findings included a negative correlation between building age and accessibility score. The results showed that once adjusted for items that did not apply to specific clinics, surveyed clinics scored an average of 73% in overall accessibility. Counters, restrooms, and exam rooms were the lowest scoring categories. The study also found a moderate negative correlation (Spearman ρ -.6274) between the age of the building and overall score and a strong negative correlation (Spearman -.71) between the age of building and mobility score. This research supports the notion that physical and environmental barriers to healthcare access still exists and that older clinical buildings run a higher risk of being non-compliant with essential ADA items and thus contribute to barrier creation.

Poster Number: 31

Category: Student/Resident/Fellow

Increased expression of non-heme iron transporters and increased iron absorption in ulcerative colitis human colon

Emily Minor, Department of Biochemistry, West Virginia University School of Medicine; Justin Kupec, MD, Department of Medicine, Section of Digestive Diseases, West Virginia University School of Medicine; Andrew Nickerson, Department of Biochemistry, West Virginia University School of Medicine; V.M. Rajendran, PhD, Department of Biochemistry, West Virginia University School of Medicine

Ulcerative colitis (UC) is a chronic inflammatory bowel disease that is characterized by mucosal inflammation of the colon. In addition to gastrointestinal symptoms, patients also frequently suffer from iron deficiency anemia. Most iron absorption occurs in the duodenum via divalent metal transporter 1 (DMT1) on the apical membrane and ferroportin 1 (FPN1) on the basolateral membrane, but the colon also contains iron transporters and can participate in iron absorption. Recent studies have shown increased duodenal DMT1 and FPN1 in UC patients, but there is conflicting evidence concerning their expression in UC colon. We hypothesize that colonic DMT1 and FPN1 are also increased in patients with UC as a means to compensate for iron deficiency. Duodenal and colonic biopsies were obtained from patients previously scheduled for endoscopy and/or colonoscopy with biopsy. RTqPCR, western blot analysis, and immunohistochemical staining of DMT1 and FPN were performed, and in vitro ⁵⁹Fe uptake was evaluated in UC colon compared to control. Colonic DMT1 mRNA and protein abundance were approximately equal to duodenal levels, while FPN1 was about one-quarter that of the duodenum. In patients with UC, DMT1 mRNA and protein abundance were increased by two-fold, while FPN1 was increased by five-fold. Immunohistochemical studies showed increased membrane localization of DMT1 (apical) and FPN1 (basolateral) in ulcerative colitis. Iron uptake was doubled in UC distal colon versus control. We conclude that patients with active UC have increased expression of colonic DMT1 and FPN1 and increased iron absorption, which may be targeted in the treatment of UC-related anemia.

Poster Number: 32

Category: Student/Resident/Fellow

Gene Regulators and Cardiovascular Risk Evaluation in Childhood/Adolescent Obesity (GRACE STUDY): Preliminary Findings & Challenges from a Translational Study

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Background: MicroRNAs mediate environmental influences on genetic expression and effect on cardiovascular risk factors (CVRF). Most studies focus on animal models and adults. The purpose of GRACE study is to explore potential relationships between select microRNAs, family history and CVRF in obese children/adolescents compared to their normal weight peers (NWP).

Methods: Participants (163) who met our eligibility criteria were approached between August 2018 to February 2019. Forty-three percent (n=69/160) who expressed interest and met our eligibility criteria were recruited from WVU Adolescent, Pediatrics and Lipid Clinics. Normal weight was defined as a BMI between the 5th and 85th percentile. Obesity was defined as BMI above the 95th percentile. Insulin resistance (IR) was calculated using HOMA-IR. Participants/a parent completed a self-administered survey at enrollment, and 60% (41/69) had fasting blood work (lipid profile, insulin, comprehensive metabolic panel, and microRNA assay) scheduled on another day. Clinical measurements were collected by an investigator. Descriptive statistics and chi-square test was performed. MicroRNA assays are underway.

Results: Majority of the study population was white, 93.65% (n=59/63), female, 75.38% (n=49/65), obese, 67.21% (n=41/66), and were in the 15 -19 age category, 66.07% (n=37/56). The proportion of participants who had at least one CVRF was higher in the obese group (OBG) compared to NWP (67.2% vs 14.75%, $\chi^2=28.3580$ $p<.0001$). Family history of hypertension and obesity in first and second degree relatives was more common in the OBG compared to their NWP, respectively (53.66% vs 25.00%, $\chi^2= 4.4752$ $p=0.03$, and 60.98% vs 35.00%, $\chi^2 = 3.6369$, $p= 0.05$). Recruitment challenges included: few participants were fasting, many lived 45 to 120 minutes away, and 89.39% (59/69) attended school.

Conclusion: Obese children present with a constellation of CVRF and positive family history. Translational research presents with unique challenges.

Poster Number: 33

Category: Student/Resident/Fellow

A Targeted Needs Assessment to Improve Referral Patterns for Palliative Radiation Therapy

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Introduction: Radiation therapy can effectively palliate a variety of symptoms in patients with metastatic cancer, using relatively low doses that infrequently cause major side effects. However, palliative radiation is often underutilized and sub-optimally implemented.

Methods: In this study, we surveyed radiation oncologists with an interest in palliative care to both identify barriers to appropriate referral for palliative RT and identify specific groups of physicians who radiation oncologists believe would benefit most from further education on timing of palliative RT referrals.

Results: A total of 28 radiation oncologists responded to the survey with a response rate of 20.5%. On average, participants felt that referrals for palliative RT were inappropriately delayed 46.5% (STD 20.2%) of the time. The most common barrier to referral for medical oncologists was thought to be potential interference with systemic therapy (33%); for primary care physicians and surgeons it was a lack of knowledge about the benefit (42%), and for palliative care physicians it was concern for patient convenience (25%). For brain metastases and spinal cord compression radiation oncology was felt to be part of the initial referral sequence more than 50% of the time, but less so for thoracic airway obstruction/bleeding (38%), esophageal obstruction (16%), or urinary obstruction/bleeding (8%), where another subspecialist was more often consulted first. Primary care, geriatric medicine, and emergency medicine were considered among the least knowledgeable specialties about palliative radiation.

Conclusion: These hypothesis-generating findings can guide approaches, including targeted education, to improve referral patterns for this important aspect of supportive care.

Poster Number: 34

Category: Student/Resident/Fellow

Training for Delivering Difficult News Using Simulation: Results from a Pilot Project in a NICU Setting

**Heather Reeves- Indiana University Purdue University Indianapolis
Current: West Virginia School of Osteopathic Medicine; Zeynep Salih, MD-Indiana University School of Medicine, Riley Hospital for Children**

Each year, 10-15% of babies born in the U.S. are admitted to the Neonatal Intensive Care Unit (NICU). It is imperative for physicians to learn how to communicate effectively and empathetically to help parents in this situation. However, a recent study concluded that the majority of physicians lacked the communication skills and knowledge of how to deliver difficult news. The aim of this pilot project was to test the feasibility and perceived effectiveness of communication training using SPIKES, Ask-Tell-Ask, and NURSE protocols in the NICU setting. The communication training sessions were held in-situ in a level II NICU. Participants consisted of medical students and pediatric med/peds residents. Sessions lasted approximately 60-70 minutes and focused on the case of a mother who had given birth to a baby with the possible diagnosis of Down's Syndrome (T21). The intern acted as a standardized patient, specifically as the young mother who portrayed different reactions to the difficult news being delivered. Before each simulation, participants received a short, interactive information session about basic communication skills and examples for Ask-Tell-Ask and NURSE. Following the simulation, participants completed a survey to articulate their overall impression of the session and judge its effectiveness. In both sessions, the medical students and residents reported the communication training sessions were relevant to NICU situations and the session helped develop their skills in delivering difficult news. The researchers are encouraged with the initial results and plan to continue the sessions using professional actors and to study and process the patient outcomes.

Poster Number: 35

Category: Student/Resident/Fellow

Serum hCG, Centrally-Acting Medications and Menopause-A Pilot Study

Ashley Rose Scholl, MSc, West Virginia University Department of Pathology, Anatomy and Laboratory Medicine; Stephanie Wright, MD, West Virginia University Department of Pathology, Anatomy and Laboratory Medicine; Danyel Tacker, PhD, West Virginia University Department of Pathology, Anatomy and Laboratory Medicine

Background:

Serum testing for chorionic gonadotropin (hCG) is often performed on women presenting to the emergency department. Interpretation of hCG test results is challenging in menopausal patients, due to low-level pituitary hCG production. Since patients taking centrally-acting medications (CAMs) can demonstrate low-level TSH and prolactin stimulation, we postulated that peri-menopausal patients taking CAMs could show low-level hCG levels, similar to menopausal counterparts.

Methods:

Sequential hCG results generated in the JW Ruby Memorial Laboratory for the ED & Observational Units (ED cohort) between 2/18/2015 and 6/18/2015 were categorized. Results classified as equivocal (5-20 IU/L), and a matched negative control underwent chart review to determine if CAMs were on the uptake form. These data were compared to hCG results in healthy recruits to pharmaceutical trials, who were not taking CAMs at study uptake.

Results:

Of 704 results, most equivocal results were reported in patients >35 years of age. This distribution was significant ($P < 0.001$) when compared to age distributions for negative (<5 IU/L) and positive (>100 IU/L) results. Of negative controls from the ED cohort, hCG <5 IU/L were produced by patients of all ages, but 81% were ≤ 45 years of age. Half of equivocal hCG results came from patients >45 years of age presenting with psychiatric complaints; 9 of these (75%) were taking CAMs at presentation.

Conclusions:

These results point to the need for further studies to understand the relationship between CAMs and serum hCG levels, particularly in peri- and post-menopausal populations. We intend to analyze a larger 2018 data set to further elucidate this relationship.

Poster Number: 36

Category: Student/Resident/Fellow

Peri-Operative Outcomes of Craniofacial Reconstruction in Children at WVU

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Craniosynostosis is the premature closure of sutures of the infant skull. Greater than 90% of cases are spontaneous. Single suture, non-syndromic craniosynostosis is the more common presentation. The incidence is reported at 1:1900 live births. Given the number of live births in West Virginia in 2015 was 19,805, one would expect about 10 cases per year. West Virginia University Ruby Memorial Children's Hospital Pediatric Craniofacial Program began in 2015. To date, forty-one cranioplasties have been performed.

We sought to audit our outcomes in comparison to national averages. We conducted a retrospective cohort study of the national data entered into the Pediatric Craniofacial Collaborative Group registry, specifically comparing performance in intraoperative transfusion of red cell containing products, total perioperative blood donor exposures, percentage of cases requiring anti-fibrinolytic use, percentage of cases requiring central line insertion, ICU length of stay, and hospital length of stay. Data entry assistance is provided by WVCTSI.

In comparison to national averages, West Virginia University Ruby Memorial Children's Hospital Pediatric Craniofacial Program has significantly less transfusions (median WVU:16.0; All hospitals:25.3; N=1729), similar length of hospital stay (median WVU:4; All hospitals:4; N=1672), but higher exposure to multiple donors (median WVU:2.5; All hospitals:1; N=1728.) Even though WVU is a smaller center; we perform at the level of centers with same volumes and outcomes.

Through the combined efforts of the members of the Pediatric Craniofacial Collaborative Group, we hope to evaluate our performance, establish best practice guidelines of care in craniosynostosis cases, and decrease the multiple donor exposures going forward.

Poster Number: 37

Category: Student/Resident/Fellow

Sensory processing and integration of real-world audiovisual stimuli in autism

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In West Virginia more than 6,000 individuals are impacted by autism and related comorbidities including seizures, severe anxiety, and sensory processing dysfunction. Aberrant sensory processing manifests in over or under responsiveness to non-noxious sensory inputs impacting every facet of life. The brain's ability to integrate auditory and visual information begins around 4 months of age, is experience dependent, and vital to proper development of language and communication. Individuals with autism integrate audiovisual information over a longer time period and this wider temporal binding window may underlie core deficits in autism including language delays and motor coordination. Most studies examining sensory integration in autism utilized artificial stimuli; therefore, our focus was to characterize how individuals with autism process real-world sensory information. During an MRI, participants watched a video of someone bouncing a basketball. A whole-brain analysis (ANOVA $p=0.0001$; ASD $n=16$; Controls $n=20$) revealed between-group differences in Parahippocampal Gyrus, Putamen, and Ventrolateral Prefrontal Cortex. These regions are known to be involved in aspects of behavior that reflect core deficits in autism including emotion regulation and executive functioning. Results suggest that deficits in sensory processing are related to higher-order cognitive processing in individuals with autism. Additionally, correlations of MRI data with temporal binding window measures and Sensory Profile scores of visual seeking in the ASD group, but not the Control group, suggest a relationship between aberrant sensory processing and behavioral phenotypes in autism. This data will benefit further development of interventions targeting multisensory integration and influence diagnostic screenings for ASD in younger children.

Poster Number: 38

Category: Student/Resident/Fellow

Challenges and Successful Strategies in Conducting Research among Family Caregivers & Patients with Rare Advanced Lung Disease in Rural Appalachia

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Background: Nearly 15 million Americans and greater than 10% of West Virginia residents live with and eventually die from rare advanced lung diseases (R-ALD), including pneumoconiosis and idiopathic pulmonary fibrosis. Research recruitment and retention, especially in Appalachia, have historically been difficult.

Aims: To describe challenges in conducting research among family caregivers and patients with R-ALD in rural Appalachia.

Methods: This study uses a random control group comparison design to test the implementation of the FamPALcare intervention with R-ALD patients and their primary family caregivers (N=40). Our empirically based coaching model guides the implementation of FamPALcare in order to initiate discussions of R-ALD symptoms and end-of-life palliative care preferences, demonstrate strategies to improve breathlessness and decrease anxiety, and encourage use of community resources. Recruitment consists of making telephone calls from a randomly chosen list of patients and inviting them to participate in the study. The random call list was generated from the Integrated Data Repository list from WVCTSI. Interventions are performed via telephone, in the home, or at a clinic, whichever the patient prefers or travel allows.

Results: Challenges in conducting research with the R-ALD populations living in Appalachia are identified. Strategies for rural subject identification, community recruitment procedures, retention plans, multidisciplinary team meeting and training, and data quality assurance will be discussed.

Conclusions: The team will identify strategic community partners and develop a manual of operation for the future trial. This pilot study provides testing of our research guides and procedures that will be used in the future NIH submission.

Poster Number: 39

Category: Early Stage Investigator

The Prevalence of Polysubstance Use among Psychiatric and Emergency Department Patients in West Virginia

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Aim: In 2017, 11.8 million people in the U.S. misused opioids with more than 63,000 deaths nationally. West Virginia continues to have the highest drug overdose mortality in the nation with 58 deaths per 100,000 population, well ahead of all other states. The purpose of this study was to assess the rate of polysubstance use.

Methods: In this retrospective study utilizing the WVU Medicine electronic medical record data repository, deidentified data were extracted from the following healthcare encounters: inpatient psychiatric admissions, psychiatric outpatient visits, and emergency department visits between 2009 and 2017 among persons who had been diagnosed with opioid use disorder (OUD) who had a positive urine toxicology for opioids at the time of the initial encounter with the healthcare system.

Results: A total of 3,032 persons met the inclusion criteria, 77% of which were polysubstance users. Across the entire sample, 40% were positive for opioids and one additional substance, 26% were positive for opioids and two additional substances, and 12% were positive for opioids and three or more additional substances. Benzodiazepines were the most common co-occurring substance, 43% among all patients. Cannabis and cocaine were the second and third most common co-occurring substance (36% and 21%, respectively). Among ED admissions, 209 were diagnosed with substance toxicity/overdose; of those, 55% were positive for benzodiazepines, 33% for cannabis, and 26% for cocaine.

Conclusions: These data demonstrate that the current substance use epidemic in the U.S. extends well beyond opioids, suggesting that comprehensive substance use prevention and treatment strategies are needed.