

CCTS Poster Presentation Abstracts

#1 Abstract Title: Promoting Timely Infant Hearing Healthcare through Patient Navigation: A Pilot Study

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Abstract: Congenital hearing loss affects 3 in 1000 children in the US, and can have a profoundly negative effect on communication, education, and socioeconomics. Although treatable, infant hearing loss should be diagnosed and treated in a timely fashion to prevent lifelong consequences. Healthcare disparities, a cultural lack of health knowledge, and poor social support have all been identified as predictors of delayed hearing diagnosis and treatment. These factors are compounded in rural regions where children with hearing loss are regularly delayed in diagnosis and treatment. The purpose of this study was to pilot a novel Patient Navigation program to promote timely infant hearing healthcare. **Methods:** We conducted a prospective, blinded, randomized controlled trial (RCT) with patients born at or referred to the UK after failing the newborn hearing screening test. We successfully hired and trained a navigator, who partnered with the intervention group to provide insight and support. All participants were given entrance and exit surveys, with navigator patients receiving an additional survey regarding the navigation experience. **Results:** We have recruited ten participants to date, with five in the Navigator arm. Four of the subjects were born outside UK. Two subjects were lost to follow-up after randomization. Participants reported the navigation to be helpful in obtaining timely infant hearing healthcare. **Conclusions:** Preliminary results of this study demonstrate patient navigation is a feasible model to apply to infant hearing healthcare. This pilot study lays the groundwork for a larger RCT study to investigate the efficacy of navigation to expedite infant hearing healthcare.

Supported by: This work was supported by University of Kentucky Center for Clinical and Translational Science, National Center for Advancing Translational Sciences, (UL1TR000117), National Institute of Health (8 KL2 TR000116-02), National Institutes of Health Loan Repayment Program, and National Institute of Deafness and Other Communication Disorders (1U24-DC012079-01). The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.**Primary Presenter / email:** Noblitt, B / bryce.noblitt@uky.edu**Classification/Topic:** Clinical Science / Other**Mentor / e-mail:** Bush, M. L. / matthew.bush@uky.edu

CCTS Poster Presentation Abstracts

#2 Abstract Title: **Macrophage Migration Inhibitory Factor (MIF) mediates High Mobility Group Box 1 (HMGB1) release from urothelial cells to cause bladder pain: A novel target for bladder pain**

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Abstract: Introduction: High Mobility Group Box-1 (HMGB1), nuclear chromatin-binding protein, is released during tissue damage to recruit inflammatory cells. We hypothesized that HMGB1 mediates pain in our bladder pain model. Urothelial PAR4 receptors cause MIF (pro-inflammatory cytokine) and pain without overt bladder inflammation. Blocking MIF signaling prevents PAR4-induced hypersensitivity. We tested whether (1) stimulating bladder PAR4 caused urothelial HMGB1 release; (2) blocking HMGB1 reduces bladder hypersensitivity and (3) MIF mediates PAR4 induced HMGB1 release. Methods: Human benign (transformed) urothelial cells (UROtsa) were exposed to either PAR4 activating peptide (PAR4-AP; 100 uM; 2 hr) or control peptide (PAR4-RP) in vitro and HMGB1 release was measured using western blotting. We measured changes in urothelial HMGB1 immunofluorescence in female C57BL/6 mice treated with intravesical PAR4-AP (100 uM; 1 hr). Responses to abdominal mechanical stimulation with von Frey filaments were determined before and 24 hr after PAR4-AP and pre-treated with or without HMGB1 inhibitor (glycyrrhizin; 50 mg/kg; i.p., N=8/group). Controls received PAR4-RP. Another group received intravesical PAR4-AP and MIF inhibitor blocker ISO-1. Urothelial HMGB1 staining was quantified. Results: PAR4-AP triggered HMGB1 release from UROtsa cells in vitro and mice urothelium in vivo. Abdominal hypersensitivity was determined 24 h post PAR4-AP. Pretreatment with glycyrrhizin prevented this. PAR4-RP had no effect. No histological evidence of bladder inflammation was observed. PAR4-AP increased urothelial HMGB1 immunostaining was blocked by ISO-1. Conclusions: Activation of bladder PAR4 receptors induced hypersensitivity through MIF induced urothelial HMGB1 release without bladder inflammation. This study identifies novel therapeutic targets for bladder pain conditions.

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CCTS Poster Presentation Abstracts**#3 Abstract Title: Macrophage Migration Inhibitory Factor (MIF) Mediates PAR-Induced Bladder Pain****Author(s):**

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Abstract: Introduction: Urothelial cells express both MIF (pro-inflammatory cytokine) and protease-activated receptors (PAR). Urothelial PAR1 mediates bladder inflammation. Thrombin (PAR1/PAR4 activator) mediates urothelial MIF release. We hypothesized that stimulation of urothelial PAR1 or PAR4 elicits release of urothelial MIF that acts on urothelial MIF receptors to mediate bladder inflammation and pain. Methods: MIF release was measured after exposing transformed human benign urothelial cells to PAR1- or PAR4-activating peptides (AP). Female C57BL/6mice treated one hour with intravesical PAR1- or PAR4-AP determined within one hour: 1) bladder MIF release; and 24 hours after treatment: 2) abdominal hypersensitivity (von Frey filament stimulation); 3) micturition parameters; 4) bladder histological changes; 5) changes in expression of bladder MIF and MIF receptors (real-time RT-PCR); 6) changes in urothelial MIF and MIF receptor, CXCR4, protein levels (quantitative immunofluorescence); 7) effect of MIF or CXCR4 antagonism. Results: PAR1 or PAR4-AP triggered MIF release from human and mouse urothelium. 24 hours after intravesical PAR1- or PAR4-AP, we observed abdominal hypersensitivity without changes in micturition or bladder histology. PAR4-AP was more effective and also increased expression of bladder MIF and urothelium MIF receptor, CXCR4. Antagonizing MIF eliminated PAR4- and reduced PAR1-induced hypersensitivity. Antagonizing CXCR4 partially prevented PAR4-induced hypersensitivity. Conclusions: Bladder PAR activation elicits urothelial MIF release and urothelial MIF receptor signaling to produce abdominal hypersensitivity without overt bladder inflammation. PAR-induced bladder pain represents an interesting pre-clinical model of Painful Bladder Syndrome/Interstitial Cystitis where pain occurs without apparent bladder injury or pathology. MIF is potentially a novel therapeutic target for bladder pain.

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CCTS Poster Presentation Abstracts

#4 Abstract Title: **Measuring Attentional Bias to Substance-Related Stimuli Using Eye-Tracking Technology**

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Abstract: Aims: Cocaine dependence is characterized by heightened attentional bias towards cocaine-related stimuli relative to neutral stimuli. Eye tracking presents a novel tool for directly measuring attention to substance-related stimuli. The aim of these studies was to assess the validity and reliability of measuring attention to substance-related stimuli through fixation time. Methods: In the visual probe task, substance-related and matched neutral images were presented side-by-side on a computer screen. Eye-tracking technology measured time spent fixating on each image. Attentional bias was defined as the difference in fixation time between neutral and substance-related images. Results: Cocaine users displayed a robust ($d = 1.15$) and reliable ($r = 0.51$) attentional bias to cocaine-related stimuli as measured by fixation time. Fixation time was also specific to substance use. Individuals dependent on both cocaine and alcohol displayed an attentional bias to both substances, whereas individuals dependent on cocaine only displayed an attentional bias towards cocaine, but not alcohol. Non-cocaine using controls did not display an attentional bias towards cocaine. Conclusions: Eye tracking applied to the visual probe task is a valid, reliable, and specific measure of attentional bias in cocaine users. Importantly, fixation time is sensitive to clinically relevant differences in substance abuse. These findings provide future directions for abuse research, such as applying eye tracking to treatment-related outcomes.

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CCTS Poster Presentation Abstracts

#5 Abstract Title: Employment following corrections-based drug abuse treatment: Preliminary Findings

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Abstract: Studies among offender populations have shown that employment following prison release is associated with decreased recidivism. This study examines differences in recidivism outcomes 12 months post release from jail, prison or community corrections program as a function of employment status. Study participants' follow-up data for this analysis were collected from May 2013 to June 2014 (N=350). The 350 consenting participants represent a follow-up rate of 81% of those who were eligible. Analysis focused on differences in recidivism (defined as being re-incarcerated on a parole violation and/or new charge) based on employment status (employed vs. not employed) during 12 months post-release. Study participants were male (83.1%), about 34 years old, mostly white (81.1%), and half were single and never married. Participants who were employed 12 months post-release (either full-time or part-time) were more likely to be younger (33.3 vs. 35.8, $p<.05$). There were no statistical differences in reported alcohol or drug use by employment status at follow-up. Participants who were employed were less likely to report being re-incarcerated in the 12 months following release (23.5% vs. 37.7%, $p<.01$). In addition, those who were employed spent significantly more days out in the community when compared to the unemployed group (335.06 vs. 287.58, $p<.001$). Further research should focus on better understanding the role of employment in criminal justice outcomes following corrections-based substance abuse treatment. Findings from this study suggest that even with similar relapse rates, the participants who were employed were less likely to recidivate.

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CCTS Poster Presentation Abstracts**#6 Abstract Title: A comparison of the behavioral effects of electronic and conventional cigarettes**

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Abstract: Aims: To examine the abuse liability of electronic cigarettes as a function of nicotine dose in comparison to preferred brand tobacco cigarettes. Methods: Five regular tobacco cigarette smokers, of a projected eight, have completed an ongoing randomized, placebo controlled, and double-blinded study on the abuse liability of electronic cigarettes. During the first 'baseline' session on each of four two-session blocks, participants completed behavioral measures after ad-lib tobacco cigarette smoking. On the second session, following 24 hours of tobacco deprivation (verified by breath carbon monoxide levels), participants completed behavioral measures of abuse liability before and after paced smoking of a preferred brand of tobacco cigarette or an electronic cigarette yielding 0, 8, or 16 mg of nicotine. Results: After 24 hours of tobacco deprivation, participants reported significantly higher ratings of "like effects" and "enjoy the cigarette" on a 100-point visual analog scale after smoking a preferred brand tobacco cigarette (m=68.2, m=67.6) compared to electronic cigarettes of 0 (m=26.8, m=33.0), 8 (m=29.4, m=33.8), or 16 mg (m=38.4, m=36.4) nicotine concentration. On a 100-point visual analog scale administered pre and post smoking, after 24 hours of tobacco deprivation, subject ratings "dizzy" and "light-headed" were decreased after smoking a preferred brand tobacco cigarette (-15.6 and -20.0), whereas electronic cigarettes of 0, 8, or 16 mg nicotine concentrations did not significantly affect these variables. Conclusions: Among tobacco smokers, commercial electronic cigarettes produce nicotine dose-related increases on multiple abuse liability measures, although less than those engendered by conventional tobacco cigarettes.

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CCTS Poster Presentation Abstracts

#7 Abstract Title: **A Comparative Analysis of Students Motives for Participation in College Physical Activity Elective and Required Classes**

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Abstract: In the U.S. today, only 39% of college students are required by their major to participate in physical education courses. Purpose: This study was designed to determine the motivational factors influencing the participation of college-aged men (n=245) and women (n=255) in instructional physical activity classes (IPAC) at a southeastern Division I University in Kentucky. We hypothesized that there would be a difference within the motives of interest and fitness when comparing students that were taking IPACs for a major requirement (Req) versus students taking the class as an elective (Ele). Methods: College aged students, 18-30 yrs., were recruited for this study based on their enrollment in group exercise, sport/court activities, strength training, or cardiovascular endurance classes. The Motives for Physical Activities Measure-Revised (MPAM-R) questionnaire was used to examine five student motivational factors: (1) Fitness, (2) Appearance, (3) Competence, (4) Social, and (5) Interest. Quantitative data were analyzed for descriptive statistics and an independent samples t-test was used to determine the differences in Req and Ele mean motive scores. Results: Nineteen different classes were analyzed for Req (n=378) and Ele (n=120) participation motives. There was a significantly higher ($p < 0.01$) fitness motive in Ele (6.07 ± 1.00) when compared to Req (5.79 ± 0.85). There were no differences in levels of interest ($p = 0.05$) for Req (5.31 ± 1.23) vs. Ele (5.07 ± 1.14). Conclusion: In conclusion, findings suggest that the main motivation for student enrollment, regardless of major or elective classification, in IPACs is fitness however, interest was also a major motive for some court and skill related classes.

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CCTS Poster Presentation Abstracts

#8 Abstract Title: **Training to Improve Inhibitory Control and Reduce Cocaine Use: A feasibility and Efficacy Pilot Study**

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Abstract: Introduction: Cocaine users display impaired inhibitory control, which is associated with poorer treatment outcomes. Following one session of training, heavy drinkers who inhibited responses to alcohol images reported less drinking in the following week. The purpose of the present study is to translate the results from alcohol studies and determine if inhibitory control training is feasible and effective when used with cocaine users. Methods: This study utilizes a novel inhibitory control training task, during which participants either inhibit responses to cocaine-related images or non-image shapes. Participants must meet cocaine abuse or dependence criteria as verified by the Structured Clinical Interview for DSM-IV and report recent cocaine use verified by a cocaine-positive urine sample. Participants will complete eight sessions over approximately 17 days. Self-report cocaine use and qualitative urine testing are assessed each session. On each training session and on the final session quantitative urine tests are conducted to assess the amount of cocaine metabolite is present in the urine. Target enrollment is 40 individuals. Results: Number of sessions completed, performance on the training task, and results of a Treatment Acceptability Questionnaire will be used to assess feasibility. Efficacy will be assessed by change in self-reported cocaine use, positive urine samples, and amount of cocaine present in the urine. Conclusions: This study uses a novel design to reach a traditionally difficult to reach population. The results regarding both training efficacy and feasibility will provide valuable information for future researchers in the fields of behavioral science and substance abuse treatment.

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CCTS Poster Presentation Abstracts

#9 Abstract Title: Distinguishing Motives of Physical Activity by College Student Classification.

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Abstract: Developing an understanding of motivational factors is essential for understanding the physical activity practices of college students as they matriculate from freshman to seniors. Purpose: The purpose of this study was to determine the motivation of students participating in physical activity courses at the University of Kentucky according to their classification (i.e. junior, sophomore). We hypothesized that 1) the highest mean score for motivation would be interest, and 2) that there would be a significant difference in the mean scores of motives when comparing student classifications. Methods: The Motives for Physical Activity Measure-Revised (MPAM-R) questionnaire was used to assess the strength of the following motives for participating in physical activities: (1) Fitness, (2) Appearance, (3) Competence, (4) Social, and (5) Interest. Male (n=245) and female (n=255) students, ages 18-30 yrs, enrolled in sport activity classes, aerobic exercise classes, and strength training physical activity courses were invited to participate. Mean scores for motivational category of the MPAM-R were determined. Differences in motivational category mean scores for classification of students were determined by a one-way ANOVA. Results: Our data show that the highest mean score for participation in KHP physical activity courses was fitness. There was a significant difference ($p < 0.05$) in the social motives between freshman (4.34 ± 1.16), sophomores (3.80 ± 1.50), and juniors (3.76 ± 1.39). Sophomores and juniors were less likely than freshman to participate in physical activity for social motives. Conclusion: The findings suggest that fitness was the desired outcome for participation in UK activity courses. However, freshman indicated "social" as motive for participation.

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CCTS Poster Presentation Abstracts

#10 Abstract Title: **Cognitive Impairment Alters Brain Functions in Emotional Pathways in Patients With Cognitive Impairment**

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Abstract: Deterioration in working memory is one of the earliest clinical features in the development of cognitive decline and old-age dementia. Our study was aimed at assessing differences in cortical regions critical to cognition and emotion processes during a non-emotional working memory task in patients with mild cognitive impairment (MCI) compared to cognitively normal (CN) peers. We hypothesize that cognitive decline alters brain functions underlying emotional processing (e.g. amygdala) and frontal control of emotion (cingulate) in patients with MCI. There were 23 participants in this study, 12 CN and 11 MCI. They each took part in a working memory task, during which functional magnetic resonance imaging (fMRI) was obtained. Participants were asked to hold two sample images in mind at each memory, then indicated whether images tested sequentially had been the match or nonmatch of the sample images. The results showed that persons with MCI compared to CN patients had a significant difference in activity within the left amygdala, right amygdala, and anterior cingulate gyrus (specifically BA 32) during memory retrieval. Within these regions, the difference between the two groups (MCI vs CN) decreased between the first versus subsequent times the image was identified. Our fMRI results indicate that increased demand of compensatory effort during cognitive task alters the brain responses of emotion in MCI patients. Additionally, there was a larger difference in activity between first and subsequent presentations in MCI patients compared to CN patients, suggesting that repetition served a greater benefit for MCI patients.

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CCTS Poster Presentation Abstracts

#11 Abstract Title: Student Motives for Participation in Physical Activity Courses: Comparing Age and Gender

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Abstract: Recent evidence has shown that the level of physical activity (PA) declines from high school to college, putting the university population at risk for developing premature morbidity and mortality. Therefore, a key component in PA research is to develop an understanding of motivation for participation in exercise programs. Purpose: The purpose of this study was to examine the differences in motivation between male (n=245) and female (n=255) students, ages 18-30 yr., enrolled in Kinesiology and Health Promotion (KHP) PA courses. Specifically, we hypothesized that females would report “appearance” as their motive, whereas males would report “fitness” as their motive for participating in PA classes. It was also hypothesized that there would be a significant difference between the motives when comparing the means by age stratifications. Methods: The Motives for Physical Activity Measure–Revised (MPAM-R) questionnaire was used to assess the strength of five motives for participating in strength-training, aerobic exercise, or various team sport classes. The five motives included: (1) Fitness, (2) Appearance, (3) Competence, (4) Social, and (5) Interest. A one-way ANOVA was used to determine differences in motives by age stratification. Results: Our data showed that the highest mean score motive for males (6.17±.86) and females (5.84±1.06) was “fitness”. We found between group differences (p<0.05) in age stratification for the motives “fitness” and “appearance”. Pairwise comparisons did not reveal any differences within groups for either motive. Conclusion: By determining the motivation for student’s participation in PA we hope to further facilitate lifelong adherence to PA.

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CCTS Poster Presentation Abstracts

#12 Abstract Title: **Fatigue and Physical Activity: Potential Modifiable Contributors to Parenting Sense of Competence**

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Abstract: BACKGROUND: Parenting sense of competence (PSC) is associated with positive parent-child interactions, high levels of parental warmth and responsiveness, and parental involvement with and monitoring of adolescents. These protective factors reduce the likelihood of child disruptive behavior problems and their known negative outcomes, including adolescent drug use, school failure, and poor quality of life. Evidence-based behavioral parent training interventions improve PSC and prevent long-term negative consequences by training parents to use effective positive parenting strategies. PSC is often a targeted outcome in studies testing the efficacy and effectiveness of these interventions. However, while inadequate knowledge and negative parenting behaviors are associated with low PSC, other modifiable contributing factors may exist. We hypothesized that fatigue and physical activity are significantly associated with PSC among parents of young children. METHOD: Parents (N=131) of preschool-aged children attending a diverse university-based pediatric primary care clinic participated in a screening study of disruptive behavior disorders. Participants completed a sociodemographic questionnaire and a battery of reliable and valid instruments, including measures of child disruptive behavior disorders, parent fatigue, and parent physical activity level. PSC was measured with the 16-item Parenting Sense of Competence Scale. RESULTS: Bivariate analyses demonstrated significant associations between PSC and a positive child screen for a disruptive behavior disorder ($p < .01$), PSC and fatigue ($r = -0.30$, $p < .01$), and PSC and physical activity category ($p < .001$). Separate multiple linear regression analyses revealed significant independent effects of fatigue ($\beta = -0.25$, $p < .01$) and physical activity category ($\beta = 0.32$ and 0.44 , $p < .01$) on PSC, controlling for the effects of disruptive behavior disorders ($\beta = -0.23$, $p < .01$ in both models). CONCLUSIONS: The negative effect of fatigue and positive effect of physical activity on PSC suggest potential complementary targets for intervention within the scope of behavioral parent training interventions. Decreasing parent fatigue and increasing parent physical activity levels may contribute to improved parenting and associated outcomes.

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CCTS Poster Presentation Abstracts

#13 Abstract Title: **A descriptive study: Psychopathology Following Exposure to Suicide and Sudden Traumatic Death in Veterans and Family Members.**

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Abstract: Background: It is estimated that in the general population each death by suicide leaves behind six “survivors”, people intimately bereaved by the loss of family members and other closely related individuals. In the military, a highly cohesive environment, a suicide has much greater potential to affect a larger number of individuals: family members as well as fellow soldiers. While increases in psychopathology and suicide are well documented in veterans, there is need for further understanding as survivors of suicide are themselves at risk for suicidal behavior and psychopathology. Purpose: To examine and compare psychopathology in veterans who have been exposed to suicide to a) veterans who have experienced a sudden traumatic death during their military career, b) veterans who have been exposed to both suicide and a sudden traumatic death and c) family members of veterans who died by suicide. Methods: Data was taken from our previous dual frame random digit dial survey of 1736 American adults. Of this sample, veterans and family who had been exposed to suicide and/or a traumatic death and family members of veterans who died by suicide were evaluated for current and lifetime psychiatric diagnoses using the Structured Clinical Interview for DSM-IV. Results: Of Family members (n= 17), 17% showed psychopathology, such as, alcohol abuse, anxiety disorder, and panic disorder. Of Veterans exposed to only suicide (n= 28), 40% showed psychopathology, such as, alcohol abuse and dependence, anxiety disorder, panic disorder and PTSD. Of Veterans exposed to only traumatic death exposure (n= 16), one subject showed a history of alcohol abuse and polysubstance dependence. Of Veterans who were both exposed to suicide and traumatic death (n= 29), 28% showed psychopathology, such as, PTSD, alcohol abuse, panic disorder and varying substance abuse and dependent. Conclusion: A larger sample size is needed to further evaluate psychopathology within the veteran population exposed to suicide and its implications.

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CCTS Poster Presentation Abstracts

#14 Abstract Title: **White Matter Microstructure Contributes to Age-Related Changes in Default-Mode Network Deactivation**

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Abstract: The default mode network (DMN) is a set of intrinsically connected regions most active when not specifically engaged in an externally-directed cognitive task. Older adults show lower decreases in DMN fMRI BOLD signal during cognitive tasks, termed “task-induced deactivation”, compared to younger adults. However, little is known about mechanisms underlying this decrease in DMN function. We hypothesize that reduced white matter integrity in DMN white matter pathways contributes to lower DMN deactivation. 53 younger (25-40yo) and 57 older (60-78yo) adults participated in an fMRI task-switching experiment and underwent diffusion tensor imaging. Using regions showing peak task-induced deactivations across the participant sample, we measured percent signal change during the task and performed white matter probabilistic tractography. Fractional anisotropy (FA) was then computed across all tracts found to connect the DMN in the tractography analysis. Results from multiple regression analyses revealed correlations between age and DMN deactivation ($r = -0.26$, $N = 110$, $p = .007$), DMN deactivation and FA within tracts connecting the DMN ($r = 0.28$, $N = 110$, $p = .004$), and FA within the DMN and age ($r = -0.53$, $N = 110$, $p < .001$). However, a mediation analysis revealed that the total relationship between age and DMN task-induced deactivation ($c = -0.26$) was explained by the indirect relationship through FA within the DMN ($ab = -0.10$, 95%CI [-0.216, -0.006]), rather than by the direct effect of age which was not significant ($c' = 0.16$, 95%CI [-0.349, 0.056]). These findings suggest that declining white matter integrity may be a structural mechanism underlying an age-related inability to reduce DMN activity during cognitive tasks.

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CCTS Poster Presentation Abstracts

#15 Abstract Title: **Changes in the default mode network's structural connectivity in aging**

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Abstract: The default mode network (DMN) is a functional brain network involved in internally directed thought, such as inner dialogue or daydreaming. The DMN is made up of multiple regions which can be segregated into core regions, including the posterior cingulate cortex (PCC), medial prefrontal cortex (MPFC), and bilateral lateral occipital cortices (LOC), and peripheral regions, including the bilateral lateral temporal cortices (LTC) and bilateral hippocampi (HC). The goal of the present study was to investigate age-related alterations in white matter structural connectivity within the DMN. 53 younger adults and 57 older adults were recruited to undergo a diffusion tensor imaging (DTI) scan. Probabilistic tractography was performed between DMN regions in each individual to allow for cross-sectional comparison of white matter structural connectivity in younger and older adults. Independent samples t-tests were used to examine age-group differences in the connections within the core (ie, PCC to MPFC), within the periphery (ie, LTC to HC), and between core regions and those in the periphery (ie, PCC to HC). There was no significant difference in white matter structural connectivity within the core ($p = 0.34$), a trend towards higher structural connectivity within the periphery in older adults compared to younger adults ($t(108) = -1.73$, $p = 0.09$), and significantly lower structural connectivity between the core and periphery in older adults compared to younger adults ($t(108) = 2.34$, $p = 0.02$). This study demonstrates selective declines in anatomic connections between the DMN core and periphery in older adults. Future studies should investigate how these structural declines impact DMN function in aging.

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CCTS Poster Presentation Abstracts

#16 Abstract Title: **A Retrospective Chart Review of the Effects of Hormone Therapy on Patients with Gender Dysphoria (Transgender Patients)**

Author(s): J. D. Fernandez, College of Medicine, U of Kentucky
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Abstract: Background: Transgender is an umbrella term for people whose gender identity and/or gender expression differs from the sex they were assigned at birth; the DSM5 currently describes transgender patients as patients with gender dysphoria. Individuals with gender dysphoria often seek hormonal therapy to induce physical changes to simulate their identified gender. Use of estrogen and testosterone has metabolic side effects regardless of whether they are used in same gender (cisgender) or transgender population, however, little is known regarding outcomes and prevalence of metabolic perturbations in the trans community. Objective: The goal of this study is to determine the effects of transgender hormone therapy on physical and metabolic parameters to quantify safety. Physical characteristics recorded in routine care (weight, blood pressure) and metabolic parameters followed according to practice guidelines (lipid panel, liver tests, hormone levels, potassium, blood counts) were collected from patient charts and compared to each individual's pre-therapy baseline levels. Method: A list of individuals was obtained from KMSF based on ICD-9 code 302.85; charts were then reviewed and data extracted including baseline data (from prior to hormone therapy) and subsequent data (up to 5 years as available). Data was collected from electronic charts (AEHR and SCM). Next, the data was recorded electronically in REDCap, a secure web server, and personal identifiers were removed, replaced by numbers attached to individual data. Results: 199 electronic charts were identified by ICD-9 code 302.85. Following exclusion criteria, including the presence of baseline data and an initial visit between 1/1/09 – 2/18/14, resulted in 23 Female-to-Male and 25 Male-to-Female entries. Data are currently under analysis, with preliminary data available for poster presentation.

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CCTS Poster Presentation Abstracts

#17 Abstract Title: **Implementation and Effectiveness of State-wide Health Promotion Programming Addressing Health Disparities for Individuals with Intellectual and Developmental Disabilities**

Author(s): K. Sheppard-Jones, Human Development Institute, U of Kentucky
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Abstract: 2014 National Core Indicators data indicate that individuals with intellectual and developmental disabilities (IDD) are at extreme disadvantage related to health and wellness outcomes. Over 70% of those on Kentucky's Supports for Community Living waiver are overweight or obese, with only 14% engaging in at least 30 minutes of moderate physical activity three days a week. These startling statistics resulted in a call to action for Kentucky. HealthMatters, Kentucky!, as a part of larger scale-up project, is a health promotion initiative aimed at improving health and health promotion of people with IDD throughout the state of Kentucky. A combination of stakeholder engagement and purposeful planning, input from the community, information sharing through training opportunities and resource development is ultimately resulting in increased opportunities and knowledge that is positively impacting health outcomes for people with IDD in the Commonwealth of Kentucky. This poster will present preliminary scale up results of this unique community-academic partnership using the HealthMatters evidence based health promotion curriculum of nutrition and exercise education for individuals with IDD. Methodology on behavior change motivation along with effective health strategies will also be highlighted.

Supported by: The project described was funded by the Kentucky Division of Developmental and Intellectual Disabilities.

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CCTS Poster Presentation Abstracts

#18 Abstract Title: Rural and Urban Differences in Acceptability of HIV Testing Sites among African American Cocaine Users

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Abstract: Drug users have been shown to be a high risk group for contraction and spread of HIV. Identifying ways to encourage testing among this group is important for treatment of HIV positive individuals and prevention of the spread of HIV. The location and type of testing site may play an important role in the willingness of drug users to be tested. Few studies have investigated acceptability of HIV testing sites among drug users and none have investigated rural and urban differences. Rural and urban populations have been shown to differ in their preferences across many health related factors, including drug-related health services. Additionally, African American cocaine users have been shown to be a particularly high risk group for HIV contraction and thus warrant additional focus. Identifying HIV testing site preferences will also allow public health leaders to target preferred sites for HIV testing interventions focused on drug abusers. The study aims to identify rural/urban differences in acceptability of various HIV testing sites. Previous data from structured in-person interviews of 400 rural and urban African American (AA) cocaine users on their perceptions for need for care and other factors, will be used to identify and rank acceptability of HIV testing sites. Logistic regression modeling, adjusting for covariates, will then be used to estimate the differences in rural/urban acceptability.

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CCTS Poster Presentation Abstracts

#19 Abstract Title: Exploring of Social Media and Mobile Apps in Sexual Drug-related Networks of Men who have Sex with Men (MSM): Plans for Recruitment and Data Collection

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Abstract: Purpose: Integrative network-level research is needed in order to comprehensively examine the overlap of sex- and drug-networks and the role of mobile apps influencing these behavior patterns and HIV/STI transmission. The purpose of this presentation is to describe an innovative study design to assess these factors, specifically on the recruitment strategy and network data collection techniques. Methods: High-risk individuals residing in Fayette County and surrounding communities (approximately 250) will be recruited via a chain-referral mechanism known as respondent-driven sampling (RDS). Interviewer-administered questionnaires will be used to collect individual- and network-level risk behavior data. Participants will be asked to provide the names, approximate age, gender and race of their sexual and drug co-usage partners. Information about sexual and drug use behaviors engaged in with each named network member will also be obtained, including those facilitated and not facilitated by the use of mobile and web apps (e.g., Grindr, Manhunt, Adam4Adam). Participants will also be asked about history of HIV testing and self-reported status. The overall network will be constructed by cross-referencing the provided information with that of other participants to determine who is connected to whom in the risk network. Network properties may also be analyzed as individual-level attributes and evaluated for associations with self-reported HIV and STI status. Results: As funding for implementation of this project is currently pending, this presentation will focus on describing the development of the research methodology. Conclusions: Designing this study brought up a variety of unique challenges and obstacles, particularly in reaching the desired participant population. Discussing and analyzing the design of this study may prove beneficial to future studies targeting similarly hard to reach groups. Network-level analysis can determine the interconnectivity of all participant relationships, demonstrating how such connections may shape trends of an entire population. This approach allows researchers to overlay multiple determinants of HIV risk to grasp how each influences the other in a given group and location.

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CCTS Poster Presentation Abstracts

#20 Abstract Title: Lung Cancer Stigma Among Healthcare Trainees: A Pilot Study

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Abstract: Lung cancer (LC) stigma, biased attitudes towards individuals with LC, among healthcare providers has been inversely associated with quality care indicators that could compromise outcomes. Additionally, federal and charitable funding supporting LC remains suboptimal and may be associated with stigma. This study examined LC stigma among medical students and evaluated a novel approach to assessing LC stigma using vignettes about charitable giving. The sample included second year medical students (N=94) currently enrolled at UK. Participants completed an online survey after being randomized to receive one of four patient cases that varied by cancer diagnosis (lung vs. colon) and smoking status (smoking vs. non-smoking). Participants were given \$6 to donate however they chose to the Lung Cancer Alliance (LCA) and/or Colon Cancer Alliance (CCA). The survey also included demographic characteristics, personal/family health history, and three LC stigma measures. Most participants (55%) donated equally to both charities, while 29% donated more to CCA and 16% donated more to LCA. Participants donated an average of \$3.28 to CCA vs. \$2.71 to LCA, a trend that was not statistically significant ($p=.09$). Participants assigned to the colon cancer/smoking scenario donated the most to LCA (\$3.23). Those assigned to the LC/non-smoking scenario donated the least (\$2.30). A 2X2 ANOVA revealed no statistically significant interaction or main effects of the study conditions on giving. The novel charitable giving paradigm used to assess LC stigma was well received but did not reveal LC stigma among medical students. Study limitations include the small sample size and the limited amount of variability in dollars to be donated. Future analyses will examine the relationship between charitable giving and other measures of LC stigma to evaluate the utility of this approach.

Supported by: Internal pilot study grant from the Department of Behavioral Science at UK**Primary Presenter / email:** Mannon, C.E. / catherine.mannon@uky.edu**Classification/Topic:** Community Science / Behavior**Mentor / e-mail:** Studts, J. L. / jlstu2@uky.edu

CCTS Poster Presentation Abstracts

#21 Abstract Title: **QuitAdvisorOB: Feasibility and Acceptability of an Evidence-based Decision Tool for Tobacco Cessation in Prenatal Settings**

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Abstract: Data from Kentucky indicate that over 25% of pregnant women smoke cigarettes compared to 12% nationally. Smoking during pregnancy puts the mother and child at risk for complications and illnesses during and following pregnancy, but tobacco cessation can reduce or eliminate these adverse outcomes. This study examined the feasibility and acceptability of a web-based, interactive decision tool (QuitAdvisorOB) designed for use by health care providers to facilitate the delivery of patient-tailored, tobacco treatment in the pre-natal setting. Eleven OB-GYN physicians and three nurse practitioners (N=14; female=86%; years in practice M=6.00±10.41) were recruited from Kentucky. Of enrolled participants, six did not complete follow-up, reducing the final sample to eight; seven physicians (88%) and one nurse practitioner (13%). Providers completed a baseline survey (PRE), received QuitAdvisorOB training and then used the tool for two months. They then completed a follow-up questionnaire (POST) and interview regarding their experience. Among the 8 participants, paired samples t-tests revealed significant increases in tobacco treatment interventions, particularly the frequency with which providers assisted with quit attempts ($t(7)=2.50, p<.041$) and arranged follow-up ($t(7)=4.78, p<.002$). Participants also reported an increase in self-efficacy to implement interventions ($t(7)=2.50, p<.041$). Notably, 75% of participants indicated that they were interested in continuing to use the QuitAdvisorOB tool and would recommend it to a colleague. Despite the small sample, this feasibility and acceptability trial revealed behavior changes regarding implementation of evidence-based tobacco treatment interventions in the pre-natal care setting, and the results exceed the a priori feasibility and acceptability criteria.

Supported by: This project was supported by a grant from the National Institute on Drug Abuse (DA032201).

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CCTS Poster Presentation Abstracts

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|----------------------------|---|
| #22 Abstract Title: | Attitudes Toward Telehealth Survivorship Services Among Rural Cancer Survivors |
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Abstract: Research indicates that between 20-40% of cancer survivors will experience depression, anxiety, or general distress following diagnosis. Compared to their urban counterparts, rural survivors have higher mortality rates, lower quality of life, more unmet information needs, and poorer mental health (MH) outcomes. This is particularly significant in Kentucky, where nearly 70% of rural counties are considered MH professional shortage areas. Along with systemic barriers, rural survivors also face individual and sociocultural barriers to MH care. Telehealth (TH) involves the use of communication technology (e.g., telephone, internet, videoconference, etc.) to provide health services and has been used to overcome geographic barriers to care. However, it remains unclear whether cancer survivors in rural Appalachia would be receptive to TH for addressing their MH needs, and how sociocultural factors might be associated with attitudes toward MH services in general. This cross-sectional study will examine current MH service consumption and perceptions of TH among individuals who have received treatment for early-stage lung cancer (LuCa) (N=80). Survivors residing in rural counties of eastern Kentucky will be identified through the Kentucky Cancer Registry and will complete a mailed survey assessing sociocultural characteristics, general MH services, and attitudes, preferences, and perceived barriers to utilization of TH services for MH. Analyses addressing the research aims of this study will be mainly descriptive. Identification of attitudes and potential barriers regarding TH service utilization can serve as a resource to inform future efforts to develop culturally-sensitive TH services for cancer survivorship care in rural Appalachia.

Supported by: This project is supported by pilot funding from the UK Department of Behavioral Science

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CCTS Poster Presentation Abstracts

#23 Abstract Title: New Potent AMPK Activators Effective Against Cancer Stem Cells

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Abstract: Colorectal (CRC) cancer is the second leading cause of cancer deaths in the United States in 2014. Patients often die due to metastasis of CRC rather than from the primary disease, and it is thought that cancer stem cells play a major role in the survival and metastasis of cancer cells after treatment. A new class of small molecules, fluorinated N,N-diaryureas (FNDs), have been formulated and shown to reduce viability of CRC cells through AMPK activation. The purpose of the present study was to evaluate whether FNDs inhibit growth and induce apoptosis of CRC metastatic cell lines and CRC stem cells in vitro and to identify an FND for development as a potential chemotherapeutic agent. **METHODS.** FNDs were identified in a high-throughput screen and selected for study based on their relative induction of AMPK activity. Compounds were arbitrarily designated as 4a, 4b, 4h, 4j, 4k, 4z, 4aa, 4bb. Metastatic CRC cell lines HT29, HTC116, and KM20, were purchased from American Type Culture Collection. Two CRC stem cell lines were purchased from Celprogen. Cell viability and IC50 concentrations were measured using a sulforhodamine B colorimetric (SRB) cytotoxicity assay. Western blots were analyzed with antibodies: PARP for apoptosis, cyclin D1 for cell cycle progression, pAMPK to confirm AMPK activation, and β -actin as a loading control. **RESULTS.** AMPK activation after FND treatment was confirmed by western blot in metastatic CRC and stem cells with a peak activation at 12 h. Furthermore, AMPK activation was noted at concentrations as low as 5 μ M, compared to metformin (an AMPK activator drug for DMII) which is typically dosed at 5-20 mM for metastatic cell lines. CRC stem cells were more resistant to FND treatment than regular metastatic CRC cell lines, with an IC50 concentration of 50 μ M for stem cells as compared to 10-25 μ M for metastatic cell lines. Cyclin D1 expression was undetectable with FND drug treatments at IC50 concentrations in CRC stem cell lines. FND 4b stood out as the strongest inducer of apoptosis, but all of the FND compounds increased apoptosis compared to control. **CONCLUSIONS.** AMPK is a key regulator of energy metabolism in cells, and cancer cells effectively make use of this pathway for their unregulated proliferation. Activation of AMPK by all FND compounds successfully inhibited the cell cycle, inhibited subsequent cellular proliferation, and induced a remarkable level of apoptosis in select FNDs in CRC metastatic and stem cells. Additionally, these effects were observed at much lower doses than other AMPK activators such as metformin and AICAR. Therefore, FNDs have considerable promise in the treatment of metastatic colon cancer, especially by preventing progression and metastasis as a result of their inhibition of CRC stem cells.

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CCTS Poster Presentation Abstracts

#24 Abstract Title: **Cabazitaxel Induces Mesenchymal Epithelial Transition (MET) and Overcomes Phenotypic Resistance in Advanced Prostate Cancer**

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Abstract: Combination of microtubule targeting chemotherapy and anti-androgen therapies have demonstrated survival benefits in late stage mCRPC patients. Docetaxel inhibits AR nuclear translocation. The present study pursued antitumor efficacy of a combination of the AR signaling inhibitor Enzalutamide (ENZ) with Cabazitaxel (CBZ) in models of advanced CRPC. The androgen responsive prostate cancer cells VCaP and LNCaP were used for in vitro assessment of protein associations and localization in response to CBZ and ENZ. Findings indicate that ENZ antagonized nuclear localization of AR and resulted in cytoplasmic accumulation, while CBZ inhibited expression of AR, and promoted nuclear AR localization. Combination treatment of CBZ with ENZ led to AR reduction and promoted mono-astral spindle formation, centrosomal clustering and multi-nucleation in CRPC cells. Mechanistic dissection demonstrated that CBZ leads to downregulation of microtubule de-polymerizing kinesins MCAK and HSET, preventing their ability to depolymerize microtubules and thus enhancing sensitivity to CBZ treatment. In vivo studies using CRPC xenograft model (with AR splice variants) demonstrated that CBZ treatment (alone or in combination with ENZ) resulted in growth stimulation driven by MET and increased nuclear AR. Apoptosis, cell proliferation, AR localization, and epithelial-mesenchymal transition (EMT) were analyzed in prostate tumors in response to treatments. We found that treatment with CBZ alone or in combination with castration led to a significant increase in Ki-67 staining compared to castration alone. Moreover our data indicate for the first time that CBZ treatment causes reversion of EMT to MET leading to luminal formation, while maintaining AR nuclear localization in prostate tumors.

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CCTS Poster Presentation Abstracts

#25 Abstract Title: **Health-Related Quality of Life and Symptomatology Following Lung Cancer
Diagnosis: A Preliminary Comparison of Current/Recent and Former Smokers**

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Abstract: Research devoted to promoting survivorship among individuals diagnosed with lung cancer is especially important in Kentucky, given that the state suffers from the highest rates of lung cancer, at 115.2 per 100,000 compared to 61.6 per 100,000 nationally (American Cancer Society, 2014). While research has documented a range of benefits of quitting smoking at the time of lung cancer diagnosis, including increased treatment efficacy, reduced risk for recurrence, enhanced survival, and lower risk of a second primary malignancy, little research has addressed the psychosocial and health-related quality of life (QoL) impact of quitting immediately after diagnosis (Parsons et al., 2010). Using data from the Lung Cancer Research Initiative of the Markey Cancer Center including the survey conducted with lung cancer patient volunteers within 6 months of their diagnosis, we compared QoL of those who continued to smoke with those who quit. Patients were identified using the Rapid Case Ascertainment Protocol developed by the Kentucky Cancer Registry, and eligibility requirements demanded that patients have confirmed pathological primary carcinoma of the lung and no previous cancer. Consented participants were then interviewed and responded to a survey, which included several standardized QoL measures: the Medical Outcomes Study Short Form – 12 (SF-12), the Functional Assessment of Cancer Therapy–Lung Cancer (FACT-L), the NCCN Distress Thermometer (DT), and three measures from the Patient-Reported Outcomes Measurement Information System Toolkit (pain, fatigue, and sleep). Preliminary results of a subset of participants (n=140 lung cancer patients) are presented: 66 (47%) were classified as former smokers (no smoking greater than 6 months before diagnosis of lung cancer), 23 (16%) as recent smokers (quit smoking 6 months before or after their diagnosis), 45 (32%) as current smokers, and 4% as never smokers. When examining QoL and symptom differences between the three groups using ANOVA, only the pain and distress measures demonstrated statistically significant differences (p 's < .05), with current smokers reporting significantly more pain and distress. However, when comparing the combined current/recent smokers group with former smokers, the FACT-L, pain, fatigue, and distress measures revealed statistically significant differences (p 's < .05). In conclusion, data did not reveal many QoL differences when comparing the recent smoking group to the current smoking group as expected. One reason for this may be the small sample size of the recent smoker group. The data suggests that after being diagnosed with lung cancer, QoL differences may not emerge quickly if an individual quits at diagnosis. Future analysis of the entire cohort are ongoing. Further studies should seek to accrue a larger sample of patients that have recently quit smoking and follow them longitudinally to examine potential longer term impact of cessation on QoL.

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CCTS Poster Presentation Abstracts

#26 Abstract Title: Prevalence of Chronic Inflammation in High-Grade Prostate Cancer

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Abstract: Purpose: Epidemiological data has implicated an association between chronic inflammation and high-grade prostate cancer. The goal of this study was to identify the prevalence of chronic inflammation in high-grade prostate cancer and to determine its relationship with prostate tumor pathological stage and grade. Methods: Consecutive series, retrospective chart review of pathologic data collected from 525 radical prostatectomy specimens. Patients identified for inclusion were adult males who underwent laparoscopic radical prostatectomy, performed by a single surgeon, at the University of Kentucky Medical Center between 2003-2013. Histological evidence of chronic inflammation was assessed in prostatectomy tissue specimens. Tumor aggressiveness was quantified by Gleason score within surgical pathology report and final pathologic stage (AJCC) assigned by surgical pathologist. Two-dimensional cross-tabulation and chi-square analysis was performed to measure the respective relationships. Results: Chronic inflammation was observed in 255 of the 525 prostate tissue specimen (48.6%). Gleason scores (GS6- GS10) corresponded with chronic inflammation prevalence rates: GS6: 54.2%, GS7: 48.4%, GS8: 42.9%, GS9: 38.7, GS10: 0% (chi-square P-value= .002). Final pathologic stages (T2-T4) corresponded with chronic inflammation prevalence rate: T2a: 71.4%, T2c: 49.3%, T3a: 42.6%, T3b: 31.4%, T4: 0% (chi-square P-value= .002). Conclusions: The study data indicates that chronic inflammation was present in less than 50% of high-grade prostate cancers treated by prostatectomy. There was a general trend towards decreasing Gleason score in prostate cancers associated with chronic inflammation. A similar reduction of pathologic stage was noted in prostate cancers associated with chronic inflammation. The study data indicates that poorly differentiated, highly aggressive prostate cancers are less likely to be associated with chronic inflammation.

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CCTS Poster Presentation Abstracts

#27 Abstract Title: Home Testing to Prevent Lung Cancer Among Renters and Homeowners

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Abstract: Background. Lung cancer is preventable through eliminating tobacco smoke and radon exposure. We examined the association between demographic factors and home testing at baseline of a larger RCT to test the effects of a tailored environmental feedback intervention to reduce home exposure to radon and secondhand smoke (SHS) with homeowners and renters. Methods. A purposive sample of homeowners (n=340) and renters (n=47) were recruited at an outpatient medical facility using stratified sampling to ensure equal proportion of those exposed to SHS in the home. Homeowners were randomly assigned to treatment or control groups. Demographics, perceived risk of lung cancer, smoking status, past 7-day SHS exposure in the home, and lung cancer worry were assessed at baseline. Free test kits for radon and SHS were provided to treatment group participants and renters at enrollment; they received \$20 to test their homes. Controls could call to request free test kits. Results. Participants with higher education were more likely to test; likelihood to test did not vary by smoking status. Renters and treatment group homeowners were more likely to test compared to controls. Compared to homeowners, renters were younger, less likely to be White, had less education, and higher air nicotine levels. Conclusions Renters (and landlords) are disproportionately affected by secondhand smoke in the home and are an important target for environmental justice and risk reduction measures. The ambulatory healthcare setting may be a promising location for environmental health risk reduction activities, especially with those at high risk (e.g., secondhand smoke in the home).

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CCTS Poster Presentation Abstracts

#28 Abstract Title: **Appalachian children are at greater risk of pediatric brain tumors**

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Abstract: Astrocytomas are the most common gliomas in the pediatric population, yet little is known about whether there is regional heterogeneity in their incidence. And despite the rise in overall pediatric cancers in the U.S. since the mid-1970s, there is little research focused specifically on children from Appalachian regions. We therefore compared the incidence of various pediatric cancers in Appalachia with non-Appalachia from 54 North American Association of Central Cancer Registries (NAACCR). The incidence rate of pediatric central nervous system (CNS) tumors was 8% higher in Appalachia (3.31 per 100,000, 95% CI 3.17-3.45) versus non-Appalachia (3.06 per 100,000, 95% CI 3.02-3.09). Astrocytomas accounted for the majority of this difference, with the rate being 16% higher in Appalachian children (1.77 per 100,000, 95% CI 1.67-1.87) versus non-Appalachian children (1.52 per 100,000, 95% CI 1.50-1.55). Among astrocytomas, World Health Organization grade I tumors were 45% higher in Appalachia (0.29 per 100,000, 95% CI 0.25-0.33) versus non-Appalachia (0.20 per 100,000, 95% CI 0.19-0.21). This is the first study to show that Appalachian children are at greater risk of CNS neoplasms, and that much of this difference is in grade I tumors. This data justifies a large scale molecular and environmental epidemiologic study to determine the cause of the higher risk in a historically underserved pediatric population.

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CCTS Poster Presentation Abstracts

#29 Abstract Title: YMCA LIVESTRONG Program Analyzed: Benefits for Cancer Survivors

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Abstract: A regular exercise regimen in cancer survivors during and post-treatment has been shown to improve fatigue as well as other quality of life measurements. To date programs such as LIVESTRONG at the YMCA are commonly used but improvements in strength and functional abilities is largely unknown. The purpose of this study was to assess the effects of the LIVESTRONG program on cancer survivors. The YMCA LIVESTRONG program contains a well-rounded exercise regime specifically designed for cancer patients, as well as diet counseling and discussion groups with specifically educated personal trainers. Measures of physical well-being are taken at the onset and at the end of the 12 week program. Pre- and post-program values were compared for chest press, leg press, and distance traveled as well as heart rate difference during the 6-minute walk test. A regression analysis was performed on age and change in lower and upper body strength and distance traveled, as well as on strength when entering the program and change in strength during the program (n=94). Upper body strength (chest press) and lower body strength (leg press) increased by 23.5% and 23.6 % respectively. There was a 14.8% ($p < 0.05$) increase in the distance traveled during the 6-minute walk test while the difference in heart rate between the beginning and the end of the test was not changed. Interestingly, there was no correlation between the age of the participants and the strength gained during the program, for either upper or lower body. However, a correlation between age and the change in distance walked was found ($r=0.42$, $p=0.004$). No correlation was found between the upper body strength at the start of the program and the change in strength, but there was a correlation ($r=0.41$, $p=0.009$) found between lower body strength at the start and the change in strength. Results from our analyses demonstrate a beneficial effect of the program on strength and cardiovascular fitness. In addition, younger participants may gain more in cardiovascular fitness, but strength gains do not depend upon age.

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CCTS Poster Presentation Abstracts**#30 Abstract Title: Validation of in vivo Myocardial Displacements from Spiral Cine DENSE MRI at 3T**

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Abstract: Background – Displacement Encoding with Stimulated Echoes (DENSE) is an MRI technique that encodes tissue displacement into the images. This allows the quantification of myocardial wall strain which is a better predictor of outcomes in patients with heart disease compared to ejection fraction. This technique has not been validated at 3T, where increased field inhomogeneities may result in measurement errors. We hypothesized that DENSE is valid at 3T and tested this hypothesis by measuring displacement errors at both 1.5T and 3T in vivo. Methods – DENSE and tagged imaging of the left ventricle were performed on 10 healthy subjects at 3T and 6 healthy subjects at 1.5T. The tagged images were used to define the locations of tag intersection points near end-systole. The displacements within the DENSE images were used to project the intersection points back into a nearly perfect grid. The deviation from a perfect grid was quantified as root-mean-squared error (RMSE). This measure of accuracy was compared between 3T and 1.5T with the Wilcoxon rank sum test. Results – The displacement accuracy in DENSE at 3T was not different from the displacement accuracy at 1.5T. Across the four slice types (four-chamber, base, mid, apex), the RMSEs at 3T and 1.5T were 1.2 ± 0.3 mm and 1.2 ± 0.4 mm, respectively. Both values were significantly lower than the DENSE pixel spacing of 2.8 mm. Conclusions – The same DENSE acquisition that has been used at 1.5T for quantification of cardiac displacements can be applied at 3T with equivalent accuracy.

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CCTS Poster Presentation Abstracts

#32 Abstract Title: MRI of Cardiac Mechanics Reveals Dyssynchronous Mechanical Function in Patients with Chronic Kidney Disease

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Abstract: Purpose: In an ongoing study by Stromp et al. in which cardiac fibrosis was identified in chronic kidney disease (CKD) patients using emerging non-contrast techniques, fibrosis was identified in 6-20% of left ventricular tissue amongst CKD patients, but less than 0.1% in healthy controls. In this study, we sought to examine whether analysis of cardiac mechanics could similarly identify the presence of fibrotic tissue in CKD patients by analyzing standard cine images. Methods: Ten healthy controls (average age 51.7 ± 6.7 , 6 M, 4 F, average BMI 23.3 ± 1.5) and seven patients undergoing routine hemodialysis (3 months or longer) for the treatment of CKD (average age 49.2 ± 15.7 , 2 M, 5 F, average BMI 32.6 ± 8.3) volunteered for the study. Imaging was performed on a 1.5T Siemens Aera scanner and a full stack of short axis images was acquired along the entire left ventricle. For each slice, endocardial borders were manually defined and applied to a feature-tracking algorithm to calculate circumferential strain in the 6 sectors representative of the standard AHA left ventricular model. Three mid-ventricular slices per patient were analyzed for average peak circumferential strain value, systolic strain rate (SSR), diastolic strain rate (DSR), and time to peak contraction (TTP). Results: Average peak strain values in healthy controls were found to be $-26.1\% \pm 3.4$ vs. $-28.7\% \pm 4.1$ in CKD patients. For healthy controls, the maximum SSR and DSR were $-131.6\% \pm 25.4$ and $165.1\% \pm 34.9$ while in CKD patients they were $-136.4\% \pm 36.5$ and $163.5\% \pm 39.5$, respectively. CKD patients exhibited a longer TTP than controls at $52.9\% \pm 9.3$ vs $42.5\% \pm 7.3$ ($p < 0.001$). Conclusions: CKD patients unexpectedly demonstrated stronger mid-ventricular contractions than controls in this pilot study. The differences in DSR and SSR were negligible between the groups, but the CKD patients had a significantly prolonged TTP.

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CCTS Poster Presentation Abstracts

#33 Abstract Title: The association of serum amyloid A with ApoB lipoproteins affects cardiovascular risk

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Abstract: Cardiovascular disease is the leading cause of death in developed nations and a major health issue in Veterans. Despite a number of different treatments, cardiovascular disease remains a major health burden, thus further treatments are needed. Individuals with obesity and/or diabetes are at particularly high risk for cardiovascular disease, and research suggests that elevated levels of serum amyloid A (SAA) may contribute to cardiovascular disease, particularly atherosclerosis. In preliminary studies in both mouse and human we have identified that SAA appears to shift between lipid particles. SAA is mainly found on HDL particles; however, we have found that in both mice and humans with obesity and/or diabetes SAA is found on LDL and VLDL particles, and we hypothesize that the presence of SAA on LDL or VLDL makes these particles more likely to cause cardiovascular disease. Future studies will investigate whether intravascular HDL remodeling plays a role in SAA's shift from HDL to ApoB containing lipoproteins and whether a correlation exists between post-prandial dyslipidemia and insulin resistance and the movement of SAA from HDL to ApoB containing lipoproteins. If this research confirms our hypotheses then the presence of SAA on LDL or VLDL may 1) be a new marker indicating humans at highest risk for cardiovascular disease and 2) be a new target of therapy to prevent cardiovascular disease.

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CCTS Poster Presentation Abstracts

#34 Abstract Title: PPAP2B Expression Regulates the Development of Atherosclerosis

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Abstract: Coronary artery disease (CAD) is the leading cause of death in both men and women worldwide. The bioactive lipid lysophosphatidic acid (LPA) accumulates in human atheroma compared to levels in healthy control tissue. LPA can be degraded by the membrane protein lipid phosphate phosphatase 3 (LPP3), encoded by the gene PPAP2B. Noncoding polymorphisms in PPAP2B associate with CAD risk, and gene expression analysis indicates that individuals possessing the risk allele exhibit lower levels of PPAP2B mRNA in leukocytes and vascular cells. We hypothesize that decreased LPP3, as a result of low PPAP2B expression, accelerates experimental atherosclerosis. Murine models of tissue specific LPP3 knockdown were generated using the Cre-Lox system driven by either the MX-1 promoter (MX-1 Δ) or the smooth muscle cell specific SM22 promoter (SM22 Δ) in mice on the atherogenic LDLr^{-/-} background. Following 12 weeks on Western diet, knockdown of LPP3 in both the MX-1 Δ and the SM22 Δ mice resulted in significantly more atherosclerosis by en face analysis compared to LPP3-fl/fl littermate controls. LPA content determined using LC/MS/MS tended to be higher in the proximal aortas of MX-1 Δ and SM22 Δ knockdown mice compared to controls. Significantly higher macrophage gene expression was observed in the MX-1 Δ mice while IL-6 levels were significantly higher in the SM22 Δ mice compared to controls. These results are consistent with accelerated atherosclerosis in LPP3 knockdown mice and suggest a protective role for LPP3 in CAD. Our findings provide mechanistic insight into the genome wide association studies that linked genetic variation in PPAP2B with risk of CAD and focus attention on the LPA/LPP3 signaling nexus as a novel therapeutic strategy to prevent atherosclerosis.

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CCTS Poster Presentation Abstracts

#35 Abstract Title: Impaired baroreflex response correlates with reduced conduit vessel contractility in female maternally separated (MS) rats and reveals α 1D adrenergic receptor (AR) dysfunction

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Abstract: Previously, we have shown that male MS rats display impaired baroreflex function and chronic blood pressure control but normal acute reactivity to α 1 adrenergic stimulation. This study tests in female (F) MS rats: 1) MAP and HR response to phenylephrine (PE), 2) ex vivo vascular reactivity in aorta and 3) aortic contractile protein expression. MS was applied 3 hr/day from postnatal day 2-14. Normally reared rats served as controls (C). Adult F rats (n=4) were anesthetized. Saline solution or PE (0.3 μ g/ μ l, 2 min) was administered i.v. Hemodynamic data was collected using an arterial catheter. PE infusion was performed before and after a bolus of mecamylamine (MECA, 0.1 mg/kg, i.v). HR/MAP slope was greater in MS compared to C rats (-1.9 \pm 0.2 vs. -0.9 \pm 0.1 bpm.mmHg⁻¹, p<0.05). MECA-induced drop in blood pressure was not different between groups. Maximal PE-induced MAP response was exaggerated in MS compared with C rats (p<0.05), showing no changes in HR between groups. PE-induced reactivity in aorta was attenuated in MS rats (68 \pm 6 vs. 96 \pm 8 % KCl, p<0.05, n=6). ACh-induced relaxation was impaired in aorta from MS rats (59 \pm 7 vs. 81 \pm 3 % relax, p<0.05). α 1A AR protein expression was similar between groups, but α 1D AR was increased in MS compared to C rats (0.4 \pm 0.1 vs. 1.3 \pm 0.2 AU, p<0.05, n=6). Contractile proteins RhoA, MLC2 and ROCKII were similar between groups. In MS rats, impaired contractile function in conduit vessels suggests an inadequate subcellular localization of the α 1D AR, that may impact the myogenic tone and the baroreflex function as well. Due to the lack of vascular response, PE-induced central effects need further investigation. Funding: R00 HL111354

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CCTS Poster Presentation Abstracts

#36 Abstract Title: Use of ECG telemetry and Cardiovascular Magnetic Resonance Imaging with Manganese Enhancement to translate in vitro Findings to in vivo Function in Rad-GTPase Knockout Mice

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Abstract: Purpose: Rad-GTPase knockout (Rad KO) provides cardio-protection against maladaptive heart failure remodeling despite in vitro cellular measures showing prolonged action potential duration and increased myocardial Ca²⁺-entry. The purpose of this study is to translate in vitro cellular findings to in vivo function. The over-riding hypothesis is that Rad KO will show prolonged QTc and increased myocardial Ca²⁺-influx in vivo. Methods: QTc as a function of RR interval was measured in freely moving, conscious Rad KO mice implanted with ECG telemeters in a lead I configuration. ECG recordings were analyzed across >24hrs. The diurnal peak and trough of HR was selected for QTc – RR interval analysis. Cardiac magnetic resonance imaging (CMR) with manganese enhancement in Rad KO mice was performed. Mice were scanned in the 3T clinical scanner; an IP cannula was used to deliver a constant infusion of Mn²⁺, and images were acquired over 1.5 hours; these were corrected for heart rate. The rate of Mn-CMR accumulation was evaluated as an index of myocardial Ca²⁺-influx. Data/Results: In vitro and molecular analysis suggests more calcium entry into cardiomyocytes during systole. ECG telemetry revealed no detectable arrhythmias in the Rad KO. Carbachol was then administered to cause supraphysiological RR intervals. At RR intervals greater than 250 ms QTc/RR analysis of Rad KO mice shows an altered QTc vs. wild type mice. Diurnal variation in heart rate allows identification of lower range of average heart rate, but within physiologically relevant limits. CMR with manganese enhancement is in pilot stage. Initial trials are shown along. It is unclear if scanning time was sufficient to establish quantification of myocardial Mn²⁺-influx. Conclusions: Rad-GTPase is a negative regulator of voltage-dependent L-type calcium channels, and in our published study we showed Rad KO cardiomyocytes have increased Ca²⁺-influx, and slow frequency induced delayed after depolarizations. The present in vivo ECG findings are consistent with some predictions made by in vitro studies. Despite delayed after-depolarizations observed at the single cell level, arrhythmias were not detected; even at supraphysiological-prolonged RR intervals by administration of carbachol. This suggests that the relatively high resting heart rate of mice is not the mechanism responsible for arrhythmia protection with increased Ca²⁺ homeostasis. The manganese-enhanced CMR will require further refinement before definitive conclusions can be reached.

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CCTS Poster Presentation Abstracts

#37 Abstract Title: **Patient-specific variability in breath-hold positions during cardiac magnetic resonance imaging has a negligible effect on quantification of cardiac mechanics**

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Abstract: Background – Cardiac magnetic resonance (CMR) can be used to quantify measures of cardiac mechanics, such as strain and torsion, from images acquired during an end-expiratory breath-hold. It has been demonstrated that measures of cardiac mechanics have superior prognostic power over traditional measures of heart function, like ejection fraction. Unfortunately, it is difficult for subjects to consistently hold their breath in a typical CMR study. The effect of patient-specific variability in breath-hold position on measures of cardiac mechanics has not been investigated. We hypothesized that a subject’s normal variability in breath-hold position would significantly affect the quantification of peak left ventricular strains. Methods – Ten healthy volunteers (Age: 29±10 years, 60% female) and six patients with a history of cardiovascular disease or myocardial infarction (Age: 58±9 years, 50% female) were consented. A 3T Siemens Tim Trio scanner was used to measure the diaphragm position during ten 10-second breath-holds to determine each subject’s breath-hold range. Navigator-gated 2-chamber, 4-chamber, basal, mid-ventricular, and apical slice of two-dimensional DENSE were acquired at the subject-specific maximum, middle and minimum breath-hold positions (with repeated middle position for inter-test quantification). A navigator feedback system enabled the subjects to view their diaphragm position in real time during image acquisition. Image data was only acquired when the subject placed their diaphragm within 3mm of a set breath-hold position, thereby ensuring that minimal breath-hold variability occurred. Radial, circumferential, and longitudinal strains were calculated for each subject and compared between diaphragm locations using a repeated measures ANOVA. The inter-test 95% limits of agreement were calculated using the Bland-Altman method. Results – The average breath-hold range was 10mm for both the healthy and patient groups. There were no clear trends or significant differences between breath-hold positions and the quantified strains. Furthermore, the differences were smaller than the inter-test 95% limits of agreement. Conclusions – Different subject-specific breath-hold positions had no significant effect on the quantification of peak left ventricular cardiac strains from two-dimensional DENSE CMR.

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CCTS Poster Presentation Abstracts

#38 Abstract Title: Transradial Approach to Cardiac Catheterization: The University of Kentucky Experience

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Abstract: Introduction: A cardiac catheterization laboratory beginning the shift towards becoming a primarily radial program undergoes a gradual transition as it moves away from performing predominantly femoral diagnostic and interventional procedures. The ease with which the crossover to the transradial approach occurs is dependent on numerous synergistic factors including physicians' ability to overcome the procedural operator learning curve, cooperation and commitment of catheterization laboratory staff, and support from the hospital. We aim to describe the launch and establishment of a radial PCI program in an academic university setting. We are interested in exploring whether our progress follows the expected learning curve and yields benefits that have been described in multiple randomized trials. Improvements in efficacy over time can be quantified through an increase in the percentage of radial cases performed per year, a decrease in the fluoroscopy time per radial case, and reductions in rates of vascular complications, bleeding, and transfusions. Methods: We identified all patients undergoing catheterization at the Gill Heart Institute from 2010- 2013, stratified them according to radial or femoral access site, and then collected a series of demographic information and procedural measures. Data was statistically analyzed with the intention of comparing each year's radial outcomes to that of the subsequent year in order to assess areas of improvement. Results and Conclusions: There was a substantial increase in the percentage of radial procedures performed each year from 2010 to 2013 at the Gill Heart Institute. Statistically significant findings across each year included decreases in transfusion rates, fluoroscopy times, and total device costs. These findings are indicative of improvement over time. They are certainly reassuring, as the number of patients treated via radial access is likely to increase, as the Center for Medicare and Medicaid Services considers "same-day" or outpatient PCI.

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CCTS Poster Presentation Abstracts

#39 Abstract Title: Developing a Method to Quantify Cardiac Perfusion

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Abstract: Purpose: Utilize a hemodialyzer as a model of microcirculation to develop methods for quantifying the amount and spatial extent of cardiac perfusion. This is useful in the diagnosis of Coronary Artery Disease (CAD) in individual patients and also for the objective evaluation CAD therapies. Methods: Saline was circulated through an Asahi (APS15) hemodialyzer placed inside a 3T Siemens Verio MR imager. Cross sectional MR images were acquired using a T1-weighted, saturation recovery imaging technique. The flow rate (Q) was varied between 100, 200, 300 and 400 (ml/min), as was the volume of the bolus- Gadolinium DTPA tracer ($\Delta V=250\mu\text{L}$ and $500\mu\text{L}$). From the images, signal intensity vs. time curves (SIC) were generated and fit with a gamma variate function. Afterwards, the upslope and areas underneath the curves (AUC) were estimated. Results: A hemodialyzer was successfully used as a model to mimic cardiac perfusion. Repeated trials indicate the methods are reproducible. Additionally the SICs are well fit by the gamma variate function. An increase in flow rate was proportional to an increase in the upslope index ($R^2=.99927$). The AUC increased proportionally to tracer volume ($500\mu\text{L}$: $250\mu\text{L}$ for 300 ml/min is 1.963). Applying the same imaging technique to patients demonstrated a similarly shaped SIC. Conclusions: The results demonstrate that changes in flow rate and tracer volume are proportional to SIC upslope and AUC respectively. Further research includes finding myocardial blood volume and flow rate through deconvolving the impulse response function from the SIC.

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CCTS Poster Presentation Abstracts

#40 Abstract Title: **Development, Validation, and Application of a Non-Contrast Cardiac MRI Technique for Patients with Renal Failure**

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Abstract: Intro: Cardiac MRI (CMR) using late gadolinium enhancement (LGE) is standard of care to image myocardial fibrosis, but LGE is contraindicated in chronic kidney disease (CKD) patients. The signal intensity of balanced steady state free precession (bSSFP) CMR images is weighted by magnetization transfer (MT) from extracellular matrix macromolecules as a function of flip angle and changes in response to fibrotic remodeling. We developed and validated 2-point bSSFP to exploiting changes in MT for safe and effective non-contrast identification of fibrosis. We hypothesize that 2-point bSSFP CMR can identify cardiac fibrosis in CKD, without contrast. Methods/Results: Our first clinical study included 47 patients with various cardiac diagnoses and 10 controls. 2-point bSSFP and native T1-mapping—another emerging non-contrast technique—were compared to LGE. Linear mixed modeling revealed that 2-point bSSFP can identify cardiac fibrosis and edema comparable to LGE and receiver operating characteristics showed area under the curve of .96, statistically significant from other non-contrast measures we studied. We are now applying 2-point bSSFP and native T1-mapping to a target population of CKD patients. Preliminary results from 7 patients and 8 controls indicate 2-point bSSFP can detect areas of diffuse and focal fibrosis. CKD patients tend to have a greater proportion of fibrotic myocardium than healthy controls measured by both techniques, but T1 mapping limitations inflate this proportion, thus increasing risk of false-positives. Conclusions: Non-contrast MRI is an important technique for patients with CKD and 2-point bSSFP may be a safe and accurate mode of detecting diffuse and focal cardiac fibrosis in these patients.

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CCTS Poster Presentation Abstracts

#41 Abstract Title: Effects of Different Intravenous Accesses for Power Injection of Iodinated Contrast in Thoracic CT Angiography

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Abstract: High quality Computed Tomography Angiogram (CTA) for thoracic aorta is an essential imaging test for evaluation of aortic diseases, many of which are medical emergencies and are associated with high morbidity and mortality. A key step in CTA is the injection of iodinated contrast, which is a complicated process that critically affects the quality of CTA and the subsequent medical interventions based on CTA reading. This retrospective cohort study aims to investigate how the quality of CTA is affected by different contrast injection schemes defined by intravenous access site, injection rate, contrast volume, gauge of the catheter, and patient parameters including age, gender, weight and height. 170 CTA for thoracic aorta studies done at UK Medical Center during 2014 were selected based on intravenous access site and size of aorta. Patient-specific and injection scheme parameters were retrieved from clinical charts. The mean value and standard deviation of attenuation in thoracic aorta and peri-aortic fat were measured and the quality of the CTA was quantitatively defined by signal-to-noise and contrast-to-noise ratios. Qualities of CTA between different groups of patients were compared statistically. We found no significant differences in CTA quality among groups with different intravenous access sites, in contrast to conventional wisdoms. A multi-factor regression linear model was constructed for standardization of contrast injection in CTA to achieve ideal quality of images for patients with varying physical parameters and intravenous access issues. This study will significantly improve the practice of CTA at UK hospitals and beyond.

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CCTS Poster Presentation Abstracts

#42 Abstract Title: Perfusion Index for management of hemodynamically significant Patent Ductus Arteriosus (hsPDA) in extremely preterm infants.

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Abstract: Background: hsPDA can cause instability in preterm infants. Echocardiography (ECHO), the current standard test to diagnose hsPDA, has significant intra/interobserver variability. Perfusion index (PI) is a noninvasive measure of perfusion based on the ratio of pulsatile to non-pulsatile flow derived from the O₂ saturation data. Δ PI is defined as the difference between pre- and postductal PI. Studies suggest that a Δ PI >1.05% is associated with hsPDA. Objective: Assess the value of Δ PI in the diagnosis of hsPDA. Methods: We prospectively enrolled infants with gestational age (GA) \leq 28wks admitted to UK-NICU. PI was continuously monitored with 2 high resolution pulse-oximeters (2sec averaging time, 1sec sampling rate) for 14 days. ECHO and treatment of PDA were ordered per physician's discretion. A blinded cardiologist independently analyzed ECHO to diagnose hsPDA. We assessed for a change in Δ PI before and after treatment of hsPDA. Results: Four patients completed the study so far. Mean GA was 26.5wks (range: 24.6-27.6) and mean weight was 1030g (range 780g-1385g). Three patients were males. The average Δ PI in clinically stable patients who received no treatment for PDA was 0.23%. PDA was treated in 2 patients; these patients showed a minimal variation in the Δ PI with a baseline Δ PI of 0.09% pre-treatment and 0.015% post-treatment. Conclusion: We speculate that an increase in Δ PI may not correlate with the echocardiographic diagnosis of hsPDA. This result is contrary to previous studies suggesting elevated Δ PI in patients with hsPDA. We will continue to enroll patients for our goal sample of 100 patients.

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CCTS Poster Presentation Abstracts

#43 Abstract Title: **Post-Operative Changes in Platelet Function as Clinical Indicators for Complications After Left Ventricular Assist Device Implantation**

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Abstract: Post-operative complications commonly arise with implantation of left ventricular assist devices (LVADs). A recent study reported that within one year after implantation, post-operative bleeding occurred in 67% of patients and hemorrhagic stroke in 5%. Another study reported that 30% of these patients required additional surgery due to bleeding complications. Bleeding risks are increased in part by the required anticoagulation therapies, as well as, by the pump mechanics of various LVADs. In fact, studies have shown that patients with LVADs have increased bleeding tendencies compared to patients without LVADs but with corresponding anticoagulation therapies. Several molecular mechanisms of bleeding in these cases have been investigated. This study aims to analyze platelet function, monitored by platelet count and various activation factors which could serve as clinical indicators of bleeding risks after implantation with specifically the Heartmate II and Heartware-HVAD LVADs, which are both commonly used nationally and at the University of Kentucky. Biomechanical analysis suggest that these two types of LVADs result in distinct hemolytic and coagulation profiles, as the Heartmate II is a continuous axial-flow pump implanted into the left ventricle, while the Heartware-HVAD is a continuous centrifugal-flow pump implanted into the pericardial space. This study is unique in that no other known studies have correlated changes in platelet activation measurements with post-operative LVAD implantation complications, and additionally, between these devices.

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CCTS Poster Presentation Abstracts

#44 Abstract Title: **Multidisciplinary Rounding Improves Team Member Satisfaction and Engagement on NICU Rounds**

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Abstract: Background: Multidisciplinary rounds (MDR) can improve communication, satisfaction, medical education and patient safety. Many challenges, including team members (TM) perceptions of not being valued on rounds, impede MDR in the intensive care setting. Objective: To improve TM presence and participation during level IV NICU rounds. Methods: Champions including physicians, advanced practice providers, nurses, respiratory therapists, pharmacists, dieticians, and social workers were identified to form a Multidisciplinary Rounding Group. The committee developed a rounding structure to overcome challenges that hinder participation. Rapid cycle changes were made every 2-wks. To evaluate progress and satisfaction we developed an observation data collection tool and an anonymous 5-pt Likert scale REDCap survey; Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), Strongly Disagree (SD). Results: A total of 2,749 patient observations were recorded during rounds from March to June 2014. Structured MDR was implemented in April. Engagement on rounds increased for all TMs during the study period; nurses 67% to 88%, respiratory therapists 28% to 75%, pharmacists 78% to 96%, dieticians 66% to 82%, and social workers 40% to 56%, all $p < 0.0001$. A total of 101 TMs responded to the survey. Overall, 67% reported (SA/A) MDR improved their efficiency vs 33% (SD/D/N), $p = 0.002$. The majority (87%) stated (SA/A) MDR improved patient care, $p < 0.0001$. Seventy three percent reported (SA/A) MDR did not have a negative impact on daily routine, $p < 0.0001$. Conclusions: A multidisciplinary initiative increased TM engagement on NICU rounds. Team members perceived multidisciplinary rounding improved efficiency and patient care without a negative impact on daily routine or an increase in rounding time.

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CCTS Poster Presentation Abstracts

#45 Abstract Title: Improving The Discharge Process From The Neonatal Intensive Care Unit

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Abstract: Background: Discharge from the Neonatal Intensive Care Unit (NICU) is a process that requires a complex and voluminous teaching experience for parents. Delays on the day of discharge are common and may limit new admissions, increase staffing needs and contribute to family and staff dissatisfaction. Objective: To increase the percentage of patients discharged before 2pm on day of discharge, from 30% to 80%. Design/Methods: A multidisciplinary team was created to improve the discharge process. Mapping the process and a self-assessment audit helped detect barriers to an on-time discharge. Actions producing delay on day of discharge were selected for improvement and rapid-cycle projects based on the plan-do-study-act format were implemented. Random audits on the day of discharge evaluated process measures. Nursing and parent satisfaction was assessed with survey. Results: Discharge before 2 pm improved from 29.6% to 66% within 4 months of this ongoing project. The most common reason for on-time discharge failure were parent/patient transportation problems. Internal factors affecting the time of discharge were physician documentation readiness. Factors detected on the self-assessment such as parental education, car seat tracing and feeding/baby care were not common in the 2 following cycles. Parents and staff satisfaction was satisfactory. Length of stay and readmission rates remained unchanged. Conclusions: We have expedited the discharge process for our NICU patients without increasing re-admission rates or reducing family/staff satisfaction.

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CCTS Poster Presentation Abstracts

#46 Abstract Title: **Impact of Interprofessional Teams on Medical Error Disclosure Conversations in a Simulated Environment**

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Abstract: Background: National agencies expect medical error reporting and disclosure to improve patient safety. While clinicians desire transparency, these attitudes are often not translated into practice. Barriers impacting disclosure are numerous and include lack of training and communication inexperience. We hypothesized that disclosure training would reduce known barriers to disclosure and that interprofessional team-based disclosure would improve transparency versus individual-provided disclosure. Methods: Medicine, nursing, and pharmacy clinicians (N=104) completed a baseline survey of attitudes and self-perceived barriers then attended 5-hour disclosure training which included simulation with standardized patients (SPs). Participants either disclosed as teams (intervention) or as individuals (control), then participated in audio-recorded focus groups. Data describing transparency and satisfaction were collected from SPs blinded to study aims. Participants completed the survey after program completion for pre-post comparison. Dichotomous outcomes were analyzed by χ^2 analysis or Fisher's exact test. Student's t-test (independent and paired sample) and one-way ANOVAs were used for continuous outcomes. Statistical significance was defined as $\alpha < 0.05$. Qualitative data is undergoing iterative thematic analysis. Results: 95 (91%) participants completed pre-post surveys. Improvements in attitudes and reductions in self-reported barriers were noted overall ($p < 0.05$). There were no differences in transparency, SP satisfaction, or reductions in barriers between intervention and control groups. Preliminary qualitative themes are teams provide more holistic information and offer mutual support in difficult conversations. Conclusions: Disclosure training improved attitudes/perceptions and reduced barriers to disclosure. No differences existed between teams and individuals on disclosure transparency. Qualitative data preliminarily indicates that teams should rely on each-other for complete information transfer in difficult conversations.

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CCTS Poster Presentation Abstracts

#47 Abstract Title: **A Survey-Based Tool to Assess Implementation of Entrustable Professional Activities**

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Abstract: Introduction: Competency-based medical education curricula are being developed in schools and teaching hospitals across the country in order to better equip medical students and residents for the demands of clinical work. This has led to the creation of Entrustable Professional Activities (EPAs), which refer to responsibilities that a trainee can be trusted to perform with minimum to no supervision. As students progress in the curriculum, they achieve increasingly greater levels of proficiency in a range of EPAs until they are finally judged competent and allowed to graduate from a program. The establishment of EPAs seeks to standardize clinical learning experiences and ensure that all students are able to perform at a certain basic level in their residencies. There has been a great deal of literature regarding the utility of this approach, but little has been said regarding the student experience with regard to the implementation of EPAs in the medical curriculum. Methods: We have developed a survey tool that uses a clinical case study to examine student comfort across a range of EPAs being considered for implementation at the University of Kentucky College of Medicine (UKCOM). Answer choices were designed to mimic a natural progression in confidence, beginning by observing a clinical skill and ending by being able to teach that skill to someone else. A link to the online anonymous survey was sent to all current students at UKCOM with expected graduation years 2015-2018. All data was analyzed using SPSS statistics software. Results: A total of 82 UKCOM students completed the survey, for a response rate of approximately 17% of the medical student population. Further analysis is pending. Conclusion: The results of our survey, which are pending, will be used to establish the current skill set of the average medical student captured at four levels of training. Our hope is to use this information to feed back into the development of appropriate and realistic competency-based medical training.

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CCTS Poster Presentation Abstracts

#48 Abstract Title: **Mycobacterial Nicotinate Mononucleotide Adenylyltransferase: A Promising Target for Novel Anti-Tubercular Drugs**

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Abstract: As new strains of *Mycobacterium tuberculosis* (Mtb) emerge which are multidrug- and extensively drug-resistant, there is a need to develop novel anti-tubercular drugs. Our research aims to find a new class of anti-tubercular compounds, targeted at Nicotinamide mononucleotide adenylyltransferase (NadD). NadD is an essential enzyme of NAD biosynthesis, against which there have recently been a number of inhibitors tested and validated in *Escherichia coli*, *Bacillus subtilis*, and *B. anthracis*. NadD is has been shown to be required for the growth and survival of mycobacteria, thus it is a good target for developing novel anti-tubercular drugs. Potential inhibitors are developed based on our crystal structure of Mtb NadD, previously discovered scaffolds active against *E. coli* and *B. anthracis*, and a structure-based computational approach. We then screen these inhibitors, and then further test the best to define their properties in vitro and in vivo. The final aim is to then determine the structures of NadD in complexes with the best inhibitors. Upon successful completion of this research, we will have developed novel anti-tubercular compounds which will be further validated in animal models of tuberculosis.

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CCTS Poster Presentation Abstracts

#49 Abstract Title: Prolonged Protection against Mitochondrial Oxidative Stress using Curcumin conjugated Poly (β - Amino Esters) Nanogels

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Abstract: Mitochondria are considered to be the energy power plants of the cell, but are also a central pathway for stimulation of oxidative stress (OS) leading to initiation and execution of cell death. OS induced mitochondrial dysfunction is characterized by a loss in oxygen consumption and reduced ATP production, and it has been linked to a wide variety of diabetic, cardiovascular, and neurodegenerative disorders. Curcumin is considered to be a potential drug to suppress mitochondrial oxidative stress, but rapid metabolism and aqueous insolubility prevent it from being an effective therapeutic. A lot of work has been done to incorporate curcumin into liposomal/micellar nanocarriers for improving the delivery of its active form. However, most formulations have limited net drug loading and exhibit significant burst release of curcumin. To resolve the problem of unhealthy curcumin bolus dosage due to burst effect and deliver the antioxidant at therapeutic levels, self-precipitated curcumin conjugated poly (β -amino ester) (C-PBAE) nanogels in dilute reaction conditions were synthesized utilizing the Michael addition chemistry. Easy control over the nanogel size by varying the reactant concentrations was achieved employing this one-pot synthesis process. Upon hydrolytic degradation of the ester bond, these curcumin PBAE pro-drug nanogels showed uniform release of active curcumin over 30 hours under physiological conditions, enhancing the release rates with control over the initial burst release effect as well as structurally stabilizing the labile drugs for an extended period of time. Real time response analysis of mitochondrion bioenergetics like basal respiration, mitochondrial ATP production using Seahorse Bioscience XF96 analyzer, showed continuous prolonged protection against H₂O₂ mitochondrial oxidative stress confirming the uniform sustained release of active curcumin from pro-drug C-PBAE nanogel.

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CCTS Poster Presentation Abstracts

#50 Abstract Title: Middle-aged Mice Rescued from Lethal Sepsis by a New Late-intervention Protocol Exhibit Long-term Muscle Dysfunction

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Abstract: Sepsis is a life-threatening condition that develops when a local infection spreads and results in systemic inflammation. Although death due to sepsis has decreased in recent years, survivors often suffer from chronic muscle weakness. The objective of this study was to develop a clinically relevant mouse model of sepsis that causes long-term muscle weakness. Polymicrobial abdominal sepsis was induced in young (4-month-old) and middle-aged (16-month-old) male C57BL/6 mice by intraperitoneal injection with a 100% lethal dose of cecal slurry (CS). ICU-like therapeutic intervention was initiated 12 hours after sepsis induction which included twice daily administration of the broad-spectrum antibiotic imipenem (1.5mg/mouse i.p.) with or without fluid resuscitation. Therapy was discontinued when the animals were normothermic and free of circulating bacteria. Muscle strength was assessed by evaluating isometric muscle force of the extensor digitorum longus two weeks after sepsis in sepsis survivors and control mice. Administration of antibiotics alone did not prevent mortality from lethal sepsis in young mice; however, 80% of animals survived when treated with fluids in addition to antibiotics ($p < 0.05$). In middle-aged mice, combination treatment resulted in 71% survival ($p < 0.05$). Combination therapy in both young and middle-aged mice resulted in significant improvement of hypothermia 12-hours after the first treatment ($p < 0.001$ in young, $p < 0.05$ in middle-age). Two weeks after sepsis induction, the surviving middle-aged mice exhibited muscle dysfunction as evidenced by altered force-frequency relationship and reduced maximum specific force ($p = 0.08$). This new sepsis animal model will be instrumental in elucidating the mechanisms responsible for sepsis-induced chronic muscle weakness which can then be targeted therapeutically.

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CCTS Poster Presentation Abstracts

#51 Abstract Title: **Lipoprotein Lipase Represses SND1, a Novel SREBP-regulated gene, to Improve the Adipose Tissue Phenotype of Mice**

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Abstract: Lipoprotein lipase (LpL) hydrolyzes the triglyceride core of lipoproteins and also acts as a bridge to allow for the uptake of the hydrolyzed cholesterol-rich remnant particle. Transgenic mice that express LpL in adipose tissue under the control of the adiponectin promoter (AdipoQ-LpL) have improved glucose metabolism when challenged with a high fat diet. This is mediated by an improved adipose phenotype, including increased expression of the anti-inflammatory adipokine adiponectin. To identify the mechanism for reduced inflammation, we performed a microarray on adipose tissue from mice challenged with a high fat diet for 10-days. Pathway analysis of the microarray revealed that genes regulated by sterol regulated element-binding protein (SREBP) transcription factors were repressed; this could be caused by increased remnant uptake by the transgene. One of the most significantly repressed genes was SND1 ($P < 0.001$). Since SND1 is implicated in cholesterol metabolism in the liver, we determined whether it is also an SREBP-regulated gene in adipocytes by treating differentiated 3T3L1 adipocytes with SREBP2 siRNA. This treatment significantly repressed SND1 mRNA 2.2 fold ($P = 0.015$). Since SND1 is proinflammatory in the liver, we next determined whether reducing SND1 would dampen adipocyte inflammatory responses. We treated differentiated 3T3L1 adipocytes with control or SND1 siRNA and then treated the cells with 100 ng/mL recombinant tumor necrosis factor (TNF) alpha. The SND1 siRNA treated cells had 1.9 fold lower MCP1 expression in response to TNF alpha than control siRNA treated adipocytes. Taken together, these data suggest that reducing SND1 by inhibiting the SREBP pathway in adipose tissue is part of the mechanism of improved adipose tissue function in AdipoQ-LpL mice.

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CCTS Poster Presentation Abstracts

#52 Abstract Title: **Foreskin as a model to study insulin-stimulated glucose uptake and adipogenesis in neonates**

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Abstract: Introduction: It has long been understood that maternal environments and activities can have profound effects on offspring health. Among these effects includes increased risk of numerous diseases such as pediatric and adulthood obesity. Globally, many laboratories are investigating prospective differences in placenta and cord blood to explore developmental changes induced by any number of maternal parameters, such as smoking, obesity, and diabetes. Instead, we propose that neonatal foreskin is capable of providing similar information, but with the added benefit that the tissue comes directly from the infants themselves. Further, living cells can be isolated from the foreskin and grown in culture so functional assays can be completed. Methods: De-identified neonatal foreskin samples from male infants were collected in growth media within 24-72 hours of birth following circumcision in the labor and delivery unit at the University of Kentucky Chandler Hospital. Dermal and dartos layers were grossly dissected and primary foreskin fibroblasts were isolated from the dermal layer. Insulin stimulated 2-deoxyglucose uptake was assessed in primary fibroblasts. Further, fibroblast predisposition to differentiate into adipocytes upon rosiglitazone stimulation was measured. Data/Results: Glucose uptake was increased by 43% in response to insulin treatment in the cells. Furthermore, adipogenesis induction was achievable following treatment with a differentiation cocktail. Conclusion: We demonstrate neonatal foreskin can be used as a novel model to examine insulin-stimulated glucose uptake and adipocyte differentiation in human infants. Future studies will be aimed at utilizing foreskin from various maternal conditions (obesity, diabetes, smoking etc.) to determine whether differences in glucose uptake and adipocyte differentiation can be detected, suggesting that fetal/developmental programming occurred.

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CCTS Poster Presentation Abstracts

#53 Abstract Title: **Impact of a University-based Program on Obese College Students' Physical Activity and Overall Health**

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Abstract: Background: More than one third of college students are overweight or obese, making college campuses an ideal setting to target at-risk behaviors. Research has indicated that self-efficacy is key in increasing physical activity (PA) in obese individuals, a vital issue given that 6 of 10 college students engage less than 3 days per week in vigorous-intensity (20 minutes or more) or moderate-intensity (30 minutes or more) PA. Purpose: The purpose of this study was to assess the effectiveness of a 15-week university-based collaborative program on changing students' PA intentions, behaviors, self-efficacy toward PA, and overall perceived health. Methods: Thirty-two full-time college students with a self-reported BMI of 30 or above participated in the university program. Baseline data were collected prior to implementation and follow-up data were collected at 15-weeks via an online survey. Process evaluation was completed post intervention by 53% of participants. Results: Findings indicate improvements in PA outcomes post-intervention as measured by: total minutes per week of moderate PA (T1: M = 72.4, SD = 77.5; T2: M = 219.7, SD = 91.6, $p = .00$); and self-efficacy towards being physically active (T1: M = 59.4, SD = 26.9; T2: M = 77.0, SD = 24.6, $p = .05$). Results from the process evaluation indicated that 83% were either very satisfied or somewhat satisfied with the program. Conclusion: Results lend support to a university program targeting obese college in successfully improving health promoting behaviors and self-efficacy, subsequently impacting PA across the lifespan.

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CCTS Poster Presentation Abstracts

#54 Abstract Title: **Allergic Eosinophilic Esophagitis in South Eastern Kentucky: The Clinical and Pathological Correlation**

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Abstract: Purpose: The aim of this project is to estimate the prevalence and develop risk stratification of EOE (Eosinophilic Esophagitis) in the South Eastern Kentucky area. Method: We analyzed data from patients (n= 100, both children and adults) who are diagnosed with EOE by upper endoscopy and esophageal biopsy showing more than 15 eosinophil cells (E-cells) per high power field (HPF) between June 2011 and May 2014. With IRB approval, data was abstracted from the ARH Regional Hospital records and entered in a Microsoft Excel Spreadsheet. The relationship between clinical findings (GERD-like symptoms, dysphagia and history of food, medication and environmental allergies), smoking history, endoscopic findings (esophageal mucosal changes and stricture) and number of eosinophil cells on biopsy were evaluated. Results: Patients ranged in age from 5 to 85, with a mean of 35 years of age. 70% were male and 75% were age 18 and older. The average BMI was 29 (range 16- 49). Only 7.2% were smokers. Overall 40% of the patients had allergies: 12% food allergies, 12% environmental allergies, 8% medication allergies, 3% both food and environmental allergies, and 5% both medication and environmental allergies. 79% of patients had GERD-like symptoms. 55% had dysphagia. 85% had endoscopic mucosal findings. 20% had esophageal stricture. 74% of patients had more than 25 E-cells per HPF. Dysphagia was more common in subjects with greater than 25 E-cells per HPF (57 vs 50%). Esophageal stricture was more common among patients with more than 25 E-cells (21 vs 15%) and older than 18 years (23 vs 17%). Endoscopic mucosal findings, including ... (may want to comment on what you considered as findings) were more common in subjects with more than 25 E-cells (89 vs 73%; p=.048), and this finding was stronger in females than males (95 vs 87%; p=.003). GERD-like symptoms, were LESS common among subjects with more than 25 E-cells (76 vs 88%). A variety of types of self-reported allergies were more common among patients with more than 25 E-cells. We found no significant association between smoking and EOE. Conclusion: There is a higher incidence of Dysphagia, E-Stricture, Endoscopic Mucosal Findings, GERD-like symptoms, and Allergies in both pediatric and adult patients with more than 25 E-Cells per HPF. Obtaining detailed allergy history (food, environmental, medication, etc.), referral to specialists, and/or have a history of dysphagia should be considered for early diagnosis and treatment in patients with GERD-like symptoms not responding to treatment.

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CCTS Poster Presentation Abstracts

#55 Abstract Title: Assessing the Effect of Behavioral Intervention on BMI Status in Obese Children

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Abstract: Purpose of Study: To evaluate the effect of behavioral modifications on the BMI status of obese children. Methods: We reviewed the records of obese children followed at the BMI Clinic over a two-year period. Data collected included demographics, anthropometrics, parental weight status, and self-reported eating and exercise behaviors. The reported behaviors were scored, and the scores were compared at the first and last visit to assess behavioral modifications. Data/Results: 127 patients, aged 2-18 years, were included in the study. There were 53 Whites, 39 Blacks, 31 Hispanics, 4 biracial; 53 females and 74 males. Based on the BMI changes between first and last visit, patients were categorized in two groups: decreased BMI 60 (45%) and increased BMI 67 (55%). At the initial visit, mean age, weight and BMI were similar between groups. Increased BMI group had higher prevalence of maternal obesity (71% vs 51%), but paternal obesity was the same among groups (64%). The decreased BMI group decreased the intake of sugar-sweetened beverages ($p=0.0249$), processed foods ($p=0.0049$), sweets ($p=0.0062$), and unhealthy snacks ($p=0.0481$) when compared with the increased BMI group. The difference in exercise behaviors was not statistically significant between the groups. Conclusions: Obese children who implemented dietary modifications were able to achieve BMI reduction, and they were under the care of less obese mothers. This study is limited by its small sample size as well as reliance on self-reported eating and exercise behaviors; however our findings emphasize the importance of maternal weight status and dietary counseling in pediatric obesity.

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CCTS Poster Presentation Abstracts

#56 Abstract Title: Changes in IOP Cause Deflection of Lamina Cribrosa

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Abstract: Hypothesis: The Valsalva maneuver (VM) causes an increase in intraocular pressure (IOP) and intracerebral pressure (ICP). We hypothesize that lamina cribrosa deflection on OCT will correlate with changes in ICP and IOP. Methods: The study population had 20 healthy volunteers from UK. VM was performed with a manometer and a mouth pressure of 30-33 cm of H₂O held for 15 seconds. The Icare® tonometer was used to check IOP before and during the VM (after 15 seconds). The Spectralis OCT® was used to acquire optic nerve head images before and during the VM (after 15 seconds). 3 of the 12 OCT sections were graded by 2 graders for anterior lamina cribrosa depth (LCD) and Bruch's membrane opening width (BMO). Results: Forty eyes were analyzed. IOP increased with the VM in all eyes (mean change: 3.2±2.2 mmHg, p<0.05). 20 eyes had anterior LC shift with the VM (mean LC position change: 20.9±13.6 µm). 14 eyes had LC posterior shift (mean LC position change -29.2±28.2 µm). 2 eyes had no change in LC position and 4 eyes had ungradable LC. Mean IOP change was significantly higher with anterior LC shift (3.65 mm Hg) versus posterior LC shift (2.93 mm Hg). Conclusions: Despite an IOP rise in all eyes, the VM causes anterior LC shift in 50% of eyes. This anterior LC shift is associated with higher IOP. The eyes with anterior LC shift presumably had a rise in ICP> IOP which would suggest that LC position changes on OCT images are able to identify fluctuations in ICP.

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CCTS Poster Presentation Abstracts

#57 Abstract Title: **Effect of Previous Cartilage Surgery Failure on Short-term Patient Reported Outcomes following Knee Osteochondral Allograft (OCA)**

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Abstract: Purpose: OCA procedures are utilized for large osteochondral defects or when other articular cartilage procedures have failed. Worse outcomes have been reported for patients with a history of previous cartilage surgery, yet the effect of previous surgery on OCA outcomes is unknown. We hypothesize that a history of previous cartilage surgery will result in lower outcomes following OCA. Methods: Patients who underwent an OCA procedure were identified from an orthopaedic registry. Patients prospectively completed the International Knee Documentation Committee Subjective Knee Form (IKDC) pre-operatively, 3-months, 6-months, and annually post-surgery. Patients' medical records were reviewed for reported history of cartilage surgery. Patients were categorized as having previous cartilage surgery (PCS) or no previous cartilage surgery (NPCS). A linear mixed-model was used to compare changes in IKDC scores between groups (PCS, NPCS) and over time (preoperative, 3-month, 6-month, last-available) ($p < .05$) adjusting for preoperative scores. Results: Forty-five patients were included, 18 PCS (age=32+10yrs, BMI=24+5, gender=13F,5M, follow-up=2.2+0.9yrs) and 27 NPCS (age=28+10yrs, BMI=24+6, gender=12F,5M, follow-up=2.0+0.9yrs) ($p > 0.05$). There were main effects for group ($p = 0.043$) and time ($p = 0.001$) with no group-by-time interaction. Mean scores by group were (PCS=44.69+14.89, NPCS=54.29+14.98). Mean scores for time were (Pre=36.45+18.49, 3m=49.5+17.80, 6m=56.6+17.84, last-available=55.2+17.98). The majority of patients reported the surgery met expectations (PCS=65%, NPCS=78%) and they would have the surgery again (PCS=71%, NPCS=91%). Conclusion: IKDC scores for both groups improved over time, but overall were reduced in the PCS group. Observed differences between groups approach or exceed published IKDC minimally clinically important difference values, suggesting a clinically meaningful difference in patient function existed between groups. The reduction in IKDC scores may indicate that patient outcomes after OCA transplantation are negatively impacted by previous cartilage procedures.

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CCTS Poster Presentation Abstracts

#58 Abstract Title: **Quality Assessment of Media Reporting on Orthopaedic Meniscal Research**

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Abstract: Context: Many patients base much of their thoughts concerning medicine on media reports. Specifically, in recent years studies concerning meniscal treatment have garnered significant attention. The quality of the reporting on this research has not been previously assessed. Objective: To objectively rate the quality of media reports regarding meniscal research. Procedures: The Altmetric© Explorer Tool was used to identify scientific articles containing the keyword “meniscus.” Articles were sorted by Altmetric score which documents blog, social media, and traditional media mentions of a specific article. Abstracts for articles with 2 or more mentions by “news outlets” underwent review, and if content was related to knee meniscal cartilage, the articles were retained. News outlet reports for retained articles were then extracted. These reports were assessed by 2 raters with a modified STROBE checklist. Criteria evaluated included title, participants, methods, results, limitations, interpretation, and generalizability, and inclusion of a reference to the scientific article (max score=8). The mean total score and percent of media reports achieving each criterion were calculated. Results: Eight articles met study inclusion criteria with one hundred twelve associated media reports. To date, the average quality score across all media articles (n=58) was 4.4. The criteria most frequently met by media articles were reference reporting (79%) and generalizability (78%). The criteria least frequently met were limitations (3%) and title (10%). Only 40% of media reports were rated as accurately reporting key study results. Conclusion: Preliminary results indicate that media reports generally adequately describe research participants and study generalizability. However, titles are rarely accurate and balanced and study limitations are only reported sparingly. It is particularly concerning that main study findings were accurately described in fewer than half of all media reports.

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CCTS Poster Presentation Abstracts

#59 Abstract Title: Serum Phosphorous Enhances the Value of Serum PTH for Prediction of Low Turnover Bone Disease in Patients with CKD-5D

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Abstract: Low turnover bone disease is a disorder along the spectrum of renal osteodystrophy. Bone biopsies are considered the gold standard for diagnosis. Serum bone turnover markers have been shown to correlate with histological turnover activity, but they are not utilized in everyday practice. The current study evaluates the usefulness of parameters used in routine practice, serum PTH combined with serum phosphorous, for assessment of low bone turnover. Ninety-three patients, (mean age 50 +/- 15 years), M:F 0.43), had bone biopsies and blood drawings for determination of blood PTH and phosphorous levels. Qualitative histologic evaluation of bone showed low turnover in 16% (n=15) and normal/high turnover bone disease in 84% (n=78). Unpaired t-tests confirmed differences between the low and normal/high turnover groups in PTH (1040 +/- 708 vs 227 +/- 172 pg/ml, p <0.0001), and in phosphorous (6.4 +/- 2.2 vs 4.9 +/- 1.4 mg/dL, p = 0.002). Cutoff values of PTH and phosphorous levels along with sensitivities and specificities were determined for detection of low turnover bone disease. ROC curve analysis of phosphorous, PTH, and combination of both were calculated. They demonstrated good to excellent AUC values for diagnosis: 0.73, 0.88, and 0.92 for phosphorous, PTH, and the combination, respectively. In conclusion, addition of serum phosphorous results to PTH, parameters routinely determined in the management of CKD5 patients, provides the clinician a useful diagnostic tool for detection of low turnover bone disease.

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CCTS Poster Presentation Abstracts

#60 Abstract Title: **Blocking Viral Access to Heparan Sulfate Reduces HMPV Infection in Human Lung Cells**

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Abstract: Human metapneumovirus (HMPV) is a recently discovered paramyxovirus that infects nearly 100% of the world population. This enveloped RNA virus causes severe respiratory disease in infants, the elderly, and immunocompromised patients worldwide. Despite its clinical significance, there is no antiviral treatment or vaccine available. Entry of paramyxoviruses into host cells typically requires the coordinated activity of the attachment glycoprotein, G, and the fusion glycoprotein, F, which promotes subsequent fusion of viral and cellular membranes. Interestingly, unlike other paramyxoviruses, recombinant HMPV without G is replication competent in cell culture and in multiple animal models, suggesting a double function of HMPV F. Our group previously showed that HMPV F alone is sufficient for binding, and this interaction requires the presence of the glycosaminoglycan heparan sulfate (HS), a repeating sulfated disaccharide sugar found on HS proteoglycans. To tease apart this interaction, we tested compounds known to either occlude HS at the cell surface or interact with potential HS-binding domains on viral proteins by mimicking HS. Variably sulfated derivatives of E. coli K5 polysaccharide interact with HS-binding proteins and have reported antiviral activity against several enveloped viruses, without anti-coagulant activity in vivo. Peptide dendrimer SB105-A10 interacts with HS chains on the cell surface. We found the pretreatment of virus with only the highly sulfated K5 polysaccharides inhibited HMPV infection in multiple human lung cell lines, suggesting negative charges from the sulfation of HS are critical for interaction with the HMPV F protein. Peptide dendrimer SB105-A10 inhibited HMPV infection as well, suggesting occlusion of HS at the target cell surface is sufficient to prevent viral binding. These results were also seen in a 3D model using Human Airway Epithelium (HAE) tissues, suggesting these interactions take place during HMPV infection in a physiologically relevant model that recapitulates the complexity of the human airway.

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CCTS Poster Presentation Abstracts

#61 Abstract Title: Comparing diagnostic criteria for Bronchopulmonary Dysplasia (BPD) according to Vermont Oxford Network (VON) and the National Institute of Child Health and Development (NICHD)

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Abstract: Background: Bronchopulmonary dysplasia (BPD) is a complication associated with significant morbidity and mortality in extremely premature infants. Incidence of BPD is used in neonatal centers as an index of quality of care. However there is no consensus as to a standard definition. The adapted NICHD definition includes both mode of respiratory support and FiO₂ requirement while VON only considers FiO₂. Objective: Compare BPD criteria of NICHD and VON. Methodology: We retrospectively reviewed electronic medical records of infants born <29 weeks gestational age (GA) from January to June 2014. FiO₂ requirement and mode of support were identified at 36 weeks post menstrual age. Infants were classified as having BPD or no BPD based on NICHD and VON criteria. NICHD criteria further divided them into mild, moderate and severe BPD. Results: Records of 41 infants were reviewed. Mean GA was 26 weeks with mean birth weight of 930 grams. By VON definition, 24 (58.5%) had no BPD, while 17 (41.5%) had BPD. Of those with no BPD, 6/24 (25%) were on nasal continuous positive airway pressure. By NICHD criteria, 7 had no BPD (17%) while 34 (83%) had BPD (mild: 35%, moderate: 3% and severe: 62%). The two criteria are significantly different; McNemar x² with Yates correction, p < 0.0001. Conclusion: NICHD classification identified more infants with BPD than VON classification. This study is continuing. Our preliminary results support a need for standardize definition of BPD across centers as an indicator of quality of care.

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CCTS Poster Presentation Abstracts

#62 Abstract Title: Predictors of Bronchopulmonary Dysplasia in Very Preterm Infants

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Abstract: Background: Bronchopulmonary dysplasia (BPD) is a common and severe complication in very preterm infants. By definition, mild BPD requires treatment with >21% FiO₂ for at least 28 days before 36 weeks postmenstrual age (PMA); moderate BPD requires the same plus continued need for <30% FiO₂ at 36 weeks PMA; and severe BPD requires ≥30% FiO₂ and/or positive pressure at the same PMA. Therefore, early prediction, prior to 36 weeks, would be useful in monitoring for BPD-associated complications. Objective: To determine early predictors of BPD, testing the hypothesis that respiratory status at 28 days will predict BPD. Methods: Records of infants born at <29 weeks PMA were retrospectively reviewed. Data collected included perinatal risk factors and respiratory status at 28 days postnatal age. Results: 41 infants' records were reviewed. Group 1 infants had no or mild BPD (n=19); Group 2 (n=22) had moderate/severe BPD. Group 1 had significantly higher mean birth weight (BW) and GA than Group 2 (BW: 1022g vs. 851g, p=0.02; GA: 27w vs. 26 w, p=0.011). BPD groups did not differ by 5-min Apgar scores, chorioamnionitis, or antenatal steroid treatment. At age 28 days, significantly more infants in Group 2 had pCO₂ ≥ 60mmHg and required higher FiO₂ compared to Group 1 (median FiO₂ of 65% versus 28%, p<0.001). Conclusion: Preliminary data show that BW, GA, FiO₂ requirement and pCO₂ at 28 days may predict the severity of BPD. Data collection is ongoing; a multivariable analysis in the future will determine the combination of significant BPD predictors.

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CCTS Poster Presentation Abstracts

#63 Abstract Title: Pulmonary Langerhans in a non smoker

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Abstract: Pulmonary Langerhans is a rare disorder classically associated almost universally with smoking. Our case is centered around a 55 year-old male that has presented initially with 6 years of dyspnea on exertion with intermittent cough. The patient's dyspnea and respiratory symptoms etiology was diagnosed as Pulmonary Langerhans by pathology. While Pulmonary Langerhans is of itself an uncommon disorder. What is even more rare is that it is almost universally seen in smoker. Our patient is a non-smoker.

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CCTS Poster Presentation Abstracts

#64 Abstract Title: Elucidating molecular mechanisms for fat graft retention

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Abstract: Background: Autologous fat grafting has become a safe and dynamic modality used for soft tissue augmentation in reconstructive surgery as an adjunct to improve functional and aesthetic form. However, current practice is plagued by tremendous variability in long-term graft retention, resulting in suboptimal outcomes and repetitive procedures. The factors and mechanisms contributing to long-term fat graft survival and resorption are not well understood. Objectives: The goal of this project is to identify specific factors and mechanisms involved in fat graft retention. Methods: In Aim 1, we will compare gene expression in lipoaspirate (aspirated fat tissue) samples from breast reconstruction patients with successful versus unsuccessful fat grafts using microarray analysis. The identification of differentially expressed genes will provide information implicating mechanisms involved in fat graft survival and resorption, which could include factors related to angiogenesis, apoptosis, inflammation, or other pathways. Selected genes will be further evaluated by real-time qRT-PCR to confirm microarray data, and Western blot analysis to evaluate expression at the protein level. In Aim 2, we will correlate in vitro properties of adipose-derived stem cells (ASCs) to in vivo outcomes of graft volume retention. Anticipated Results: We predict that expression of genes related to angiogenesis, apoptosis, inflammation, and cell proliferation will be altered in lipoaspirate samples from the successful versus unsuccessful fat graft group, and that ASCs in the unsuccessful fat graft group will demonstrate altered cellular morphology, and suppressed proliferation and adipogenic differentiation potential in contrast to the successful fat graft group. Conclusion: Our findings will identify factors and mechanisms contributing to fat graft retention. This information could be valuable in developing targeted enrichment strategies for fat grafts that could facilitate their viability and longevity.

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CCTS Poster Presentation Abstracts

#65 Abstract Title: **An Intracranial Petri Dish? Formation of abscess in prior large stroke after decompressive hemicraniectomy.**

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Abstract: Objective: Development of brain abscess following an infarction is a rare clinical condition. There have been 11 cases in the literature. Because of this uncommon complication following stroke, many patients were treated with potent antibiotics only and did not survive. We present two cases in which patients received aggressive surgical resection of brain abscess and survived. The analysis in the literature confirmed our finding that surgical intervention of brain abscess in post- stroke patients offers the most benefit. Methods: A 58 year old male was transferred to our institution with left hemiparesis, hemisensory loss, neglect, and hemianopsia. CTA demonstrated large volume right hemispheric infarct. He underwent decompressive hemicraniectomy but developed fevers and swollen fontanelle 6 weeks later that did not improve with antibiotics. MRI demonstrated progression of ring-enhancement of the old infarct and abscess formation was suspected. In another case, a 42 year old female was admitted to our institution with aphasia and weakness on the right side. CTA showed left MCA territory infarction and decompressive hemicraniectomy was performed. Patient recovered well but a brain abscess was suspected during a routine pre-operative CT before cranioplasty. Results: In the first case, patient was then taken for resection of the infarcted brain tissue involved. The patient's consciousness was also improved and was discharged with antibiotics treatment. The patient subsequently underwent cranioplasty with synthetic bone graft with no complications. In the second case, the suspected abscess was resected surgically and culture of abscess grew *Pantoea agglomerans* and *Bacillus macerans*. The patient underwent cranioplasty one month later and remained in good condition. Conclusion: Secondary abscess formation after significant ischemic stroke is a rare condition that carries potential for high morbidity/mortality. The limited body of literature with the addition of our two cases supports aggressive management with surgical drainage of brain abscess to increase survival.

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CCTS Poster Presentation Abstracts

#66 Abstract Title: **Predictors of Mortality in Emergency General Surgery Patients Presenting With Perforated Peptic Ulcer Disease**

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Abstract: Introduction: Despite the decrease in symptomatic peptic ulcer disease the incidence of emergency general surgery for perforated ulcer disease has not changed and carries significant mortality. We hypothesize that comorbid factors are predictors of mortality in patients with perforated peptic ulcer requiring emergency surgery. Methods: A retrospective review of patients presenting between January 1, 2004 and November 13, 2013 with perforated peptic ulcer requiring surgery. Patients <18 years of age were excluded. Charts were reviewed to analyze risk factors for increased mortality. Risk factors evaluated were: age, BMI, lactate, albumin, INR, PTT, serum sodium, hemoglobin, and number of subsequent procedures required. Statistical analysis by Mann-Whitney U-test. All tests are two-sided and p values of <0.05 were regarded as statistically significant. Regression analysis was performed on all risk factors versus time to death for patients who survived less than 30 days. Results: 135 patients were identified (58 female, 77 male). The mean age was 58. 30-day mortality was 14.60%. Death within 30 days was associated with an increased age (68 vs. 56.32, p = 0.0016), increased BMI (27 vs. 25.43, p = 0.0424), decreased albumin (2.20 vs. 2.92, p = 0.00088), increased creatinine (2.16 vs. 1.43, p = 0.000844), and decreased hemoglobin (11.10 vs. 13.36, p = 0.000366). Increased age (>55) was associated with a 22.33% increase in mortality. Hypoalbuminemia (< 3g/dl) was associated with a 16.5% increase in mortality. Increased creatinine (>1.5mg/dl) was associated with a 28.48% increase in mortality. Anemia (hemoglobin <12g/dl) was associated with a 20.75% increase in mortality. Conclusions: Patients requiring surgery for perforated ulcer have a high risk of death. This data supports the association of several comorbid factors associated with higher mortality among those patients requiring emergency surgery for perforated peptic ulcer disease. Further research is needed to establish a causal relationship among these comorbidities and mortality among patients undergoing surgical repair in perforated peptic ulcer disease.

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CCTS Poster Presentation Abstracts

#67 Abstract Title: **Analysis of Inflammatory and Pro-Coagulant Factor Gene Expression in Visceral Adipose Tissue of Patients with Intra-Abdominal Sepsis: Adipose Tissue is a Major Source of Systemic PAI-1 which Correlates with Sepsis Severity**

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Abstract: Background: Adipose tissue has become increasingly recognized as an important contributor to chronic inflammatory diseases. Using a murine endotoxemia model, we previously reported that visceral adipose tissue is also highly active during the initial stages of acute inflammation. We further identified visceral adipose tissue as a major source of inflammatory cytokine IL-6, and pro-coagulant factors PAI-1, PAI-2, and Thbs-1 during endotoxemia [Aging Cell 2013, PMC3633415]. Objective: The purpose of this study was to evaluate the clinical significance of inflammatory cytokines and pro-coagulant factors that are produced by visceral adipose tissues during sepsis. Methods: Surgical patients undergoing an abdominal procedure were enrolled and categorized into four groups: Control (N=10), Local Inflammation (N=9), Sepsis (N=6), and Severe Sepsis (N=8). Visceral adipose tissues and blood samples were collected. Histological analyses were performed on formalin-fixed adipose tissues. qRT-PCR analysis was utilized to determine the expression level of inflammatory and thrombotic factors. Concentration of plasma proteins were measured by ELISA. Results: Adipose tissues from patients with sepsis or severe sepsis were absent of inflammatory cell infiltration and showed trends of increased mRNA levels of IL-6, IL-1 β , PAI-1, PAI-2, and Thbs-1. Among these, PAI-1 was consistently and significantly upregulated more than 20-fold in the severe sepsis group compared to controls. Plasma concentration of PAI-1 strongly correlated with PAI-1 mRNA levels in each of the adipose depots sampled ($r=0.9$: mesenteric, $r=0.7$: epiploic, $r=0.8$: omentum). Circulating procalcitonin was significantly elevated in the severe sepsis group only ($p<0.001$), and correlated strongly with plasma PAI-1 concentration ($r=0.8$). Conclusion: The severity of intra-abdominal sepsis is strongly associated with high plasma concentrations of PAI-1, likely derived from upregulated PAI-1 production by resident cells within visceral adipose tissues.

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CCTS Poster Presentation Abstracts

#68 Abstract Title: **How Easy, Reliable, and Understandable is Online Information about Plastic Surgery Procedures?**

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Abstract: The purpose of this study is to assess the readability of online information available on common cosmetic plastic surgery procedures. The majority of Americans have access to the Internet and nearly 80% of users utilize the web for healthcare-oriented information. However, deficient health literacy remains a widespread public issue and the National Institutes of Health (NIH) recommends that all patient resources be written around a sixth-grade level. We have evaluated the resources on common cosmetic procedures for patient use on multiple healthcare websites in order to identify potential areas of improvement and highlight those sections that may serve as paradigms for future revisions. Our study design is descriptive and correlational. We have performed readability assessments on healthcare-oriented resources from the American Society of Plastic Surgeons and related top websites (Wikipedia, Medscape, etc), using tests including the Flesch Reading Ease, Flesch-Kincaid Grade Level, SMOG Grading, Coleman-Liau Index, Gunning-Fog Index, the New Fog Count, the New Dale-Chall Readability Formula, FORCAST formula, Raygor Readability Estimate, and the Fry Graph. With the results of our analysis we are able to recommend modifications to the patient education sections in order to increase the readability of the literature and allow greater comprehension amongst a wider audience.

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CCTS Poster Presentation Abstracts

#69 Abstract Title: Surgical Management of Benign Tumors of the Heart: A Single Center Experience

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Abstract: Introduction: Primary neoplasms of the heart are relatively uncommon, but represent an important cardiovascular pathology since early diagnosis can be curative. The purpose of this study was to share our institutional experience and surgical management of benign cardiac tumors. Methods: In this retrospective chart review of patients, we evaluate the incidence, demographics, clinical presentation, histopathological findings, surgical management, and outcomes of patients undergoing procedures at a single tertiary care center for treatment of benign cardiac tumors from January 2000 to October 2013. Results: 16 patients (4 male and 12 female) with a mean age of 47.3 years (range of 23-79 years) were identified. The most common presenting symptoms were dyspnea (53%), constitutional symptoms (32%), chest pain (26%), and neurological symptoms (16%) and endocarditis (11%). All benign tumors were grossly resected on cardiopulmonary bypass. Myxomas were the most common cardiac tumors, most occurring in the left atrium. There was one postoperative mortality. No tumors recurred during our follow-up period. Conclusion: Early clinical suspicion and use of multiple imaging modalities is key to early diagnosis of benign cardiac tumors. Although these tumors have a risk for severe cardiac and systemic symptoms, referral to experienced centers for prompt surgical resection under cardiopulmonary bypass provides excellent early and long-term results.

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CCTS Poster Presentation Abstracts

#70 Abstract Title: Management of Spontaneous Pneumothorax: A Single Center Experience

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Abstract: Objectives: Management of patients with primary spontaneous pneumothorax is controversial. We sought to review our experience in the treatment of primary spontaneous pneumothorax (PSP) by comparing outcomes from video-assisted thoracoscopic surgery (VATS) with thoracotomy. Methods: A retrospective review of electron and paper medical charts identified 104 consecutive operations performed at University of Kentucky Chandler Medical Center for spontaneous pneumothorax management between the dates January 2000 and January 2013. Follow-up phone calls were made to ensure absence of re-occurrences outside of our hospital system. Results: Eighty-eight patients (84.6%) underwent VATS repair with unilateral and contralateral recurrence rates of 6.8% and 11.4%, respectively. Mean operative time was 97.2 minutes +/- 34.8 minutes; mean postoperative hospital stay was 5.8 days +/- 3.6 days. Mechanical pleurodesis/pleurectomy was performed in 94.3% of cases. Comparatively, 16 patients (16.4%) underwent thorocotomy repair with unilateral and contralateral recurrence rates of 0.00% and 6.25% respectively. Mean operative time for the thorocotomy group was 188.4 minutes +/- 43.7 minutes; mean post-operative stay was 4.6 +/- 1.5 days. Mechanical pleurodesis was performed 12 times (75.0%). Conclusion: In our study, the VATS group had a significant reduction in OR time ($p=.0016$), a non-significant increase in unilateral recurrence ($p=.5869$), and no reduction in postoperative length of stay. Contralateral recurrence rate did not vary between groups.

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CCTS Poster Presentation Abstracts

#71 Abstract Title: Plastic Surgery Medicare Reimbursement: Analysis of Claims and Payments

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Abstract: In an effort to improve the transparency, accountability, and affordability of the United States healthcare system, on April 9, 2014, the Centers of Medicare and Medicaid Services (CMS) released the Provider Utilization and Payment Data Physician and Other Supplier Public Use File (PUF) with information on services and procedures provided to Medicare beneficiaries by healthcare professionals. For this study, the dataset was condensed into procedures containing the sub-specialty designation "Plastic and Reconstructive Surgery" within the Medicare enrollment database, and other specialties were extracted only on a summary level. Techniques including pivot tables, visual basic functions and macros, graphs, charts, and other methods were utilized for data analysis. Recent trends in Medicare reimbursement for select procedures were also analyzed using data from the physician fee schedule database from the years 2007 to 2014. Results extrapolated from the data include the most frequently coded plastic surgery procedures, procedures with the greatest total reimbursement and the highest reimbursing individual procedures. Geographic analysis was performed by ranking states according to total Medicare payments. Procedures were also grouped based on the type of procedure and data between these groups were compared. It is increasingly valuable for physicians to acknowledge the forces that drive physician reimbursement and to be aware of related trends and variation in their particular specialty. This study offers insight into features and trends of Medicare reimbursement for plastic surgery procedures.

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CCTS Poster Presentation Abstracts

#72 Abstract Title: **Assessing The Impact of Video-Based Training on Laceration Repair: A Comparison to the Traditional Workshop Method**

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Abstract: Introduction: Medical school curricula in the United States have been more recently focusing on the early integration of clinical sciences and clinical experiences into medical students pre-clinical years. For many medical students, the common mode of instruction for developing the procedural skill of laceration repair is largely from live workshop training requiring a significant amount of physical resources and physician time to train the students. This study compares the effectiveness of video-based learning (VBL) to traditional live workshop learning (LWL) on student laceration repair performance. Methods: Forty first-year medical students with no prior experience with suturing and laceration repair were randomized into two groups: VBL and LWL. The students' competency for laceration repair was evaluated at two assessment times (7 days and 77 days post-training) using a 22-point Suture Task Checklist. A Welch Two Sample t-test was used to compare performance between groups. Results: For the first assessment, 36 students were evaluated. The LWL group (n=17) scored a mean of 18.59 (SD 1.8, 95%CI 17.6-19.3); while the VBL group (n=19) scored a mean of 18.21 (SD 1.8, 95%CI 17.3-19.0) (p value 0.549). For the delayed assessment, 31 students were evaluated. The LWL (n=15) scored a mean of 17.87 (SD 2.5, 95%CI 16.6-19.1); while the VBL group (n=16) score a mean of 17.75 (SD 2.5, 95%CI 16.6-19.0) (p value 0.8979). Discussion: Medical students often utilize shadowing experiences, simulation labs, and live workshops to develop procedural skills such as laceration repair that will better prepare themselves for their clinical rotations. Many of these experiences require tremendous amount of training resources (physician time, space, practice materials, and live tissues) and planning to synchronize the availability of students and physicians. The results of this study suggest that video-based learning can be as effective as live workshop training. The implementation of accessible video-based learning into medical students pre-clinical education may be a cost-effective way to teach students procedural skills while saving time and teaching-resources. While video-based learning serves as a promising educational tool, some limitations to this mode of learning include limited interaction with residents and physicians and lack of instructor feedback.

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CCTS Poster Presentation Abstracts

#73 Abstract Title: Relationships of Isometric Strength and Range of Motion of the Hip with the Star Excursion Balance Test and Functional Movement Screen

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Abstract: Hypothesis: Greater isometric hip strength (IHS) and hip passive range of motion (PROM) will be associated with greater performance on the Star Excursion Balance Test (SEBT) and Functional Movement Screen (FMS). Number of Subjects: Forty-two NCAA Division I women's soccer players (19.65±1.12yrs; 166.93±3.84cm; 60.99±4.31kg). Procedures: All participants were tested bilaterally in three directions of the SEBT; modified FMS (mFMS); PROM of hip internal (IR) and external rotation (ER); and IHS-extension. Twenty-one participants were also assessed bilaterally for IHS-abduction and IHS-ER. The mean SEBT directional scores were normalized to stance leg-length, then averaged creating an SEBT composite score. The lowest scores of three trials for each mFMS test were summed to obtain a single value (#/12). PROM (degrees) was measured using a goniometer. HIS torque values were obtained with a hand-held dynamometer (Nm/kg). Statistical Analysis: Pearson product correlations were used to assess relationships of SEBT and mFMS scores with PROM and IHS. Significance was set a priori at P<0.05. Results: IHS-extension (r=-0.314,P=0.003), IHS-abduction (r=-0.569,P<0.001), and IHS-ER (r=-0.416,P=0.006) were negatively correlated with SEBT-anterior (SEBT-A) scores. PROM of IR (r=0.365,P=0.001) and ER (r=0.231,P=0.032) were positively correlated with SEBT-A scores. IHS-extension was positively correlated with mFMS scores (r=0.231,P=0.032). Conclusions: The SEBT-A was inversely related to IHS, indicating that higher SEBT-A scores could mask hip strength deficits. The SEBT and mFMS were weakly correlated with PROM and IHS-extension. Thus, the SEBT and mFMS may not be appropriate indicators of isolated hip strength and PROM, and should be measured independently from the SEBT and mFMS.

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CCTS Poster Presentation Abstracts

#74 Abstract Title: **Modulation of Spinal Excitability through Transvertebral Direct Current Stimulation in Subjects with Motor Incomplete Spinal Cord Injury**

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Abstract: According to the National Spinal Cord Injury Statistical Center, as many as 300,000 people in the United States are living with spinal cord injury (SCI). Unfortunately, efforts to minimize neurologic damage in acute SCI have met with only limited success. Thus, there is an urgent need for interventions to enhance recovery of function for people with SCI. To address this evidence gap, we have recently demonstrated that a novel technique called transvertebral direct current stimulation (tvDCS) has neuromodulatory effects on the corticospinal tract in healthy volunteers. To build on these results, we are conducting a study of tvDCS in participants with SCI. Our central hypothesis is that active tvDCS will lead to a greater increase in corticospinal excitability than sham tvDCS, in a polarity-dependent manner. Four subjects (target n=10) with motor incomplete SCI have participated in a crossover comparison of anodal versus cathodal versus sham tvDCS, at thoracic level T10-T11 (total of 3 separate sessions per subject). Each subject received 20 minutes of each tvDCS condition. The order of the conditions was randomized. Primary outcome measures included Hmax/Mmax ratio recorded in triceps surae muscle bilaterally. Preliminary results indicate that cathodal and anodal polarizations may yield opposite effects when measured by Hmax/Mmax ratio and transcranial magnetic stimulation. These results will help establish a reliable, reproducible tvDCS methodology to modulate spinal excitability. Our next planned study phase will evaluate the effects of tvDCS paired with locomotor training for subjects with motor incomplete SCI.

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CCTS Poster Presentation Abstracts

#75 Abstract Title: Geographic Distribution of Stroke in Appalachian Kentucky

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Abstract: Introduction: Appalachian Kentucky is a region with pronounced health disparities. Many of the residents are of low socioeconomic status, with relatively low educational attainment, and have few resources to assist with management of chronic diseases in their communities. The population has high rates of many chronic diseases including diabetes, heart disease, and several types of cancer. Although there has been significant research focusing on chronic diseases in this population, relatively little is known about the geographic distribution of stroke and the association of place of residence and access to rehabilitation services. This study was designed to document the geographic distribution of stroke and rehabilitation facilities in Appalachian Kentucky. The results from the study are intended to provide a foundation for future research on strategies to increase use of post-stroke rehabilitation. Methods: Data were obtained from records of strokes diagnosed between January 1, 2010 and December 31, 2014. Addresses were geocoded to map occurrence of stroke. Addresses of rehabilitation services in the study area were also collected and mapped. Results: Data from a total of 46 strokes and regional rehabilitation services were included in the database to generate maps. When the number of observations was 5 or less, the precise locations of residences were not provided to protect the identity of participants. Conclusions: Assessment of the geographic distribution of strokes in Appalachia is a necessary step toward improving understanding the epidemiology of this disease. Assessment of geographic factors that influence access to rehabilitation services has potential to improve care for stroke patients and their families

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CCTS Poster Presentation Abstracts

#76 Abstract Title: Health Promotion in a Rural Population: Tobacco Use Reduction Project

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Abstract: The overriding goal for this Center for Clinical and Translational Science funded project included the reduction of tobacco use by a rural, poverty stricken community that consisted of residents in Eastern Kentucky. Many of the residents suffer from poverty and comorbidities of tobacco abuse. Specific project goals were reflective of Healthy People 2020 goals: increase tobacco-free environments in schools, and to increase the proportion of persons covered by indoor worksite policies that prohibit smoking. The National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, which is a component Centers for Disease Control and Prevention outlined Best Practices for Comprehensive Tobacco Control Programs (2014). Evidence based strategies recommended for community programs to reduce smoking includes efforts to “change the knowledge, attitudes, and practices of tobacco users and non-users and also to engage in strategies to address....how and where tobacco is used.” Influencing social norms regarding the use of tobacco through public education of the effects of smoking and the effects of second hand smoke is one component of the project. Another component of the project was the promotion of development of smoke free community and school policy. Finally, available smoking cessation services were promoted. Morehead State University Student Nurses worked with students from the local high school to develop educational materials and to disseminate information regarding the effects of smoking. This process provided both high school and nursing students the opportunity to develop leadership skills, communication skills, and knowledge attainment of the effects of tobacco smoke.

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CCTS Poster Presentation Abstracts

#77 Abstract Title: A Multiple Health Behavioral Change (MHBC) Intervention Program in Appalachia, KY

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Abstract: Background: Being both obese and a smoker increases the probability of developing type 2 diabetes, cardiovascular disease, and cancer, diseases that impact Appalachian residents disproportionately. Hart and Edmonson Counties, Kentucky have a high incidence of obesity (33.3% and 31%, respectively) and smoking (26% and 50%, respectively). Weight gain associated with smoking cessation also can undermine health benefits of quitting, and may lead to smoking relapse. Aim: To implement and evaluate a Multiple Health Behavioral Change (MHBC) program that combines Cooper Clayton Method to Stop Smoking (CCM) and the National Diabetes Prevention Program (DPP) for weight control. Method: A 16-week intervention was administered in Hart County to adult smokers (men and women). Baseline assessments consisted of BMI, waist circumference, breath CO level, lipid profile, and HbA1C. Approximately one week after baseline assessment, participants attended weekly classes. During the initial 3 weeks, the CCM was administered. At week 4, facilitators introduced a modified 12-week DPP phase of the program concurrently with CCM sessions. Posttest assessment included program evaluation and a repeated assessment. A similar program was proposed in Edmonson County, but with a sequential delivery of the two curricula. Result: Two of the four Hart County program participants completed the curriculum. By end of the MHBC program, both had quit smoking and experienced an average weight loss of 5%. Discussion: Recruitment and retention has been a significant challenge. Despite utilizing a variety of recruitment strategies, we were unable to enroll participants for the program in Edmonson County. We speculate that lack of time and inadequate transportation presented a barrier to attending the program; however, we intend to conduct focus groups and interviews to explore why we encountered recruitment and retention challenges.

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CCTS Poster Presentation Abstracts

#78 Abstract Title: Cowan Creek Community Gardens: Healthy Eating

Author(s): V. Horn, Grow Appalachia and Community Farm Alliance

Abstract: Background: Even in relation to Kentucky, a state that has poor lifespan and high incidence of preventable illness, the public health statistics for our far southeast counties are stark. In 2005, Kentucky ranked 7th in the nation for the highest percentage of the adult population diagnosed with diabetes, including Letcher County, averaging above 10%. Eastern Kentucky's 5th congressional district which includes Letcher County ranks last among all congressional districts in the health index of the American Human Development Project. Aims: To increase physical activity among residents in Letcher County by offering a community garden program and to promote healthy eating by providing cooking workshops, demonstrating healthier cooking methods. Methods: Residents were invited to work in the community garden 2 hours daily, three times per week and to attend a Monday Market Meals cooking class, learning and practicing basic cooking skills to incorporate fruits/vegetables into daily meals. Results: Twenty residents participated in the program and all but 3 reported one or more of the following health issues--diabetes, high blood pressure, overweight, heart disease, digestive issues, or other. Participants ranged in age from 18-84 and half were over age 55; 70% were female and the primary preparer of meals in the household; 100% of participants age 55 and over reported cooking daily, while those less than 55 reported once per week; and, on average, participants reported cooking for 1-3 individuals. The most frequently used cooking technique was baking, with frying second. The primary reason listed for attending cooking class was to learn healthy alternatives for family meals. Eighteen participants reported having a garden but the average number of minutes per day being physically active was less than one hour. Outcome: Overall, the program was successful in that 19 of the 20 participants reported they will use the skills learned during the cooking classes at home.

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CCTS Poster Presentation Abstracts

#79 Abstract Title: **Implementation of thermoregulation bundle in Low Birth Weight infants (LBW) to prevent admission hypothermia**

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Abstract: Background: Hypothermia in low birth weight newborns is independently associated with mortality, yet it occurred frequently at our institution. Methods: The Quality improvement project extended over 12 consecutive months. We developed a standard thermoregulation bundle for the delivery room and transfer to the NICU, including standardization of temperature measuring on admission. Generally, babies <30 weeks EGA were placed in a plastic bag. Corrective measures included addition of placing the baby on disposable chemical warming mattresses. The bundle also included keeping warm blankets inside the transport incubator. Transport incubators were kept warm at all times. Small group bedside nursing education was done to discuss potential risks of hypothermia and a standard work document was developed. Measures: The infant was considered hypothermic if temperature was < 36°C. Admission temperature data was obtained from VON for the years 2012 and 2013. Percentage of admission hypothermia in both years was compared. Babies whose temperatures fell below 36°C were evaluated individually for cause of admission hypothermia. Results: We achieved our goal of 50% reduction in admission hypothermia by our target date. There were 134 inborn LBW babies before (2012) and 123 after (2013) bundle implementation. Introduction of the bundle decreased the incidence of hypothermia. In 2012, 55% of the babies had admission temperature less than 36°C. In 2013, only 10% of the babies had admission temperature less than 36°C suggesting 80% decrease in admission hypothermia. Implications: This thermoregulation bundle resulted in sustained improvement in hypothermia rates during delivery room stabilization of LBW newborns.

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