HEALTH SCIENCES PAPER ABSTRACTS

ILEAL INTERPOSITION SURGERY CANNOT PREVENT THE ONSET OF TYPE 2 DIABETES IN RATS. *PING ZHAO*, UNIVERSITY OF NORTH ALABAMA. APRIL STRADER, SOUTHERN ILLINOIS UNIVERSITY CARBONDALE.

Background: Bariatric surgeries are effective in resolving type 2 diabetes independent of body weight loss. We have used ileal interposition (IT) surgery, a special type of bariatric surgeries, to study the role of the lower intestine in metabolic improvement. The surgery effectively improved glucose tolerance after the rats were treated by low-dose streptozotocin (STZ). However, no one knows if the surgery could have the similar effect if it gets done before STZ treatment.

Methods: Fourteen male Long-Evans rats received either sham or IT surgery first and then treated with STZ (35 mg/kg) eleven weeks after the surgeries. Body weight was measured as well as food intake, body composition and glucose tolerance before and after the surgeries.

Results: IT surgery improved glucose tolerance before STZ treatment. However, IT surgery did not delay the onset of diabetes as glucose tolerance was not improved four weeks after STZ treatment. No significant difference was found in either body weight or body composition during the whole experiment period.

Conclusion: IT surgery effectively can improve glucose tolerance in euglycemic rats without STZ treatment; but IT surgery cannot not prevent the onset of diabetes caused by low-dose streptozotocin (STZ).

MAJOR DISEASE MORTALITY RATES IN ALABAMA WATERSHEDS. *RONALD HUNSINGER* AND SUZANNE OBERHOLSTER, SAMFORD UNIVERSITY.

Alabama is noted for its abundance of lakes and waterways. Accusations have been made concerning human health problems due to various toxic pollutants discharged into these waterways. This study used the Alabama Department of Public Health (ADPH) data bank for disease mortality rates (years 2010 through 2013) for counties in the watersheds of Alabama Lakes and/or Rivers. Five major diseases were used as health indicators in these watersheds: cancer, Alzheimer's disease (AD), heart disease, stroke, and diabetes. Rates were statistically compared to the state- and waterway cohort county- rates for each disease. Of the five health indicators examined, results showed that the mortality rates for cancer were higher in the Weiss Lake watershed, which essentially encompasses only Cherokee County. Alzheimer's disease (AD) mortality rates were also significantly higher in the Weiss Lake watershed. Fish advisories for PCBs in fish are present in Weiss Lake. While AD mortality rates were somewhat elevated in the Wheeler Lake area (upper Tennessee River in Northwest Alabama watershed), this was due to the excessively high mortality rates of the disease in only one county of this watershed, Lauderdale. AD mortality rates in this county were the highest in the state. Animal studies have shown neurodegeneration following perfluorooctanoic acid (PFOA) exposure. However, Lauderdale County is considerably downstream and separated by two dams from a disputed point source of perfluorooctanoic acid (PFOA)/perfluorooctyl sulfonate (PFOS) discharge, which is in Lawrence County. Other considerations that might be linked to high AD mortality rates in Lauderdale County area are a history of coal ash contamination,

containing heavy metals, and an aluminum plant was once operational in the county. Neighboring Colbert County, home for the coal ash plant and directly across the Tennessee River from Lauderdale County, showed only a slight, but insignificant, increase in AD mortality rates, as compared to other watershed areas and to state rates. Other counties in the Wheeler Lake area showed no significant increase in the disease mortalities examined in this study. Further analysis of ADPH data banks, show that the rates of AD mortality tended to be higher than the state rate in other watersheds, except for Lake Martin, which coincidentally, does not carry any fish advisories. ADPH fish advisories are present in most of these waterways due to mercury and, in the case of Weiss Lake, due to PCBs. Surprisingly, AD mortality rates were also notably higher in the lower southeastern counties of the state, a region without any significant rivers and watersheds. Thus, it is not clear why AD mortality rates were elevated in these areas, although small creeks and tributaries there do carry fish advisories due to mercury contamination. In conclusion, this study showed that no definite geographical causal effect exists between PFOA/PFOS and AD mortality rates. The role of Hg and PCB contamination in contributing to AD in the study areas is possible. Non-pollution factors that might contribute to higher AD mortality rates in the lake areas of Alabama could possibly include such things as a demographic predisposition for retired individuals to settle and age. Indeed, Russ et al. (2014) in a meta-study, show that rurality (living in, or more specifically growing up in, rural areas) in and of itself is positively correlated with AD mortality.

SCHOOL-BASED INTERPROFESSIONAL ASTHMA SELF-MANAGEMENT PROGRAM FOR MIDDLE SCHOOL STUDENTS: A FEASIBILITY TRIAL. *DONNA COPELAND*, DONNA COPELAND, TIM OP'T HOLT, KRISTINA MILLER, KIM NORRIS AND RHONDA LUCAS, UNIVERSITY OF SOUTH ALABAMA. ELLEN BUCKNER, SAMFORD UNIVERSITY.

Asthma is the most common chronic disease in children and is a major cause of morbidity loss of school days, and increased hospitalizations resulting in increased healthcare expenditures. As a result, a new model for healthcare provision and education needs to be developed. The utilization of a common communication among adolescents, parents, primary providers and school nurses using a web-portal and common Asthma Action Plan has been shown to reduce symptoms, improve control, reduce school absences, and reduce unnecessary costs. Therefore, an inter-professional team consisting of faculty, nursing students (NS), respiratory therapy (RT), and computer science (CS) students implemented a pilot asthma self-management program in a medically underserved area. NS and RT students provided asthma assessments, one-to-one coaching, and group education over five sessions, using Power Breathing for Teens, curriculum. CS students collaborated with NS/RT to develop web-based e-portal and android app Two groups of middle school students with significant asthma participated in the study. After completion of the program asthma symptoms decreased, control increased, and self-efficacy and asthma responsibility increased over the intervention period.

The study examined asthma control, self-efficacy, and asthma self-management responsibility. Further significance of the project was defined in terms of interdisciplinary collaboration skills, the feasibility of implementing a school-based program in the community, and integration of technology. These elements propose a new model for providing asthma education. A model of adaptation integrates the multiple factors in the development of the adolescent's self-

management. This multi-dimensional approach has promise for improving health in the middle-school aged medically-underserved population.

COMPUTED TOMOGRAPHY CONTRAST INJECTIONS. *DONNA CLEVELAND*, UNIVERSITY OF SOUTH ALABAMA.

Intravenous contrast agents are used in computed tomography for several reasons. The initial vascular opacification can be used for anatomic localization; distinguishing vessels from a mass; and determining vascular displacement or invasion by a tumor. Specific vascular diseases such as aneurysms, stenosis, loss of vascular integrity or extravasation of the contrast medium may also be assessed from the initial contrast injection. To some extent, urinary tract function may be assessed. Tumors and normal parenchyma do not contrast enhance to the same extent or at the same time. This differential enhancement can be used to maximize lesion detectability. The timing of the CT scans and the contrast injection protocols must be chosen carefully. Sometimes a lesion will be hypovascular compared to normal tissue, and in some cases a lesion may be hypervascular to the surrounding tissue in a certain phase of enhancement. It is important to know in which phase a CT should be performed depending on the pathology you are looking for.

The degree of contrast medium enhancement is the result of a combination of complex factors including the rate, amount, concentration of contrast material administered; the speed of injection; the timing of the scans; cardiac output; extravascular redistribution; and renal filtration and excretion of contrast material. A drip infusion of IV contrast medium usually does not result in ideal enhancement because of inconsistent flow rates and too slow a rise of plasma iodine concentration. This method has largely been replaced by bolus injections from a mechanical injector. Mechanical injectors are mandatory for use of injection rates as high as 5 or 6ml/s and to obtain a sustained, reproducible level of contrast medium enhancement. The major disadvantage of a power injector is the slight risk of extravasation of contrast material into the soft tissues. It is therefore imperative that the patient be able to alert the technologist immediately if a local burning sensation occurs so that the injection can be stopped, preventing tissue damage. The injector is loaded with 100 to 180 ml of 60% contrast medium, with injection rates varying from 1 to 6 ml/s depending on the specific indication. Different delay times are used to match scanning

with the arrival of contrast medium to the appropriate vessels and organs. With the use of spiral or helical volumetric scanning a large region such as the liver (typically 30 cm or more) can easily be examined in several seconds.

With a single bolus injection of contrast medium, the pattern of vascular enhancement during the first circulation and the pattern of vascular and tissue enhancement during recirculation can be studied. This paper focuses on images that display the different phases of enhancement, the timing of CT scanning that capture those phases, and a few scanning protocols that are important for a successful diagnostic CT scan using contrast enhancement.

SPEECH RECOGNITION ERRORS: IMPLICATIONS FOR AGING. *RACHEL SHORT* AND KIMBERLY SMITH, UNIVERSITY OF SOUTH ALABAMA.

In natural environments, listeners are faced with having to understand speech in a variety of listening conditions. Listeners are often able to understand speech with accuracy in interrupted or steady-state background noise by exploiting useful glimpses of the auditory information, but still make recognition errors (Cooke, 2003). Previous findings suggest unimpaired younger listeners are more successful at speech recognition in interrupted conditions compared to steady-state noise (Dubno, Horwitz, & Ahlstrom, 2002). Therefore, this study evaluated the extent to which degraded spoken information in sentences is recognized by age-normal hearing older listeners in interrupted and steady-state noise. Nine older listeners repeated sentences that were presented in interrupted noise at three proportions of preservation, 33%, 50%, 66%, and steady-state noise (SSN). Responses were transcribed, and the number and type of errors for key words in the sentences were scored for each condition. For total, whole and part word errors in the interrupted noise condition, proportion of signal preservation was critical. Fewer errors were made when the signal was more preserved (66%) compared to less preserved (33%). For whole word errors, in both noise conditions, listeners made significantly more omission errors than substitution errors, and significantly more substitution errors than addition errors. For part word errors, in both noise conditions, listeners made significantly more substitution errors than either omission or addition errors. We also compared the interrupted 33% and SSN conditions directly, as performance on these two conditions was similar. No differences emerged between the two noise conditions for total, whole, or part word errors. These findings imply that older listeners resolve speech signals similarly across noise conditions. Differences in cognitive or perceptual processing in older listeners may explain these findings compared to younger listeners.

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2. Dubno, J. R., Horwitz, A. R., & Ahlstrom, J. B. (2002). Benefit of modulated maskers for speech recognition by younger and older adults with normal hearing. The Journal of the Acoustical Society of America, 111(6), 2897-2907.

HOMELESSNESS: ATTITUDES OF NURSING STUDENTS. *MEGHAN SERGEANT*, UNIVERSITY OF SOUTH ALABAMA.

The purpose of this study is to assess nursing students' attitudes toward the homeless and the impact that clinical experience of working with the homeless has on the nursing students' attitudes. Homeless individuals are hesitant to seek health care from professionals, yet health is one of the biggest problems in this population. The attitude health care professionals have manifests in the way they care for patients. In order to better care for the homeless, health care students can be taught to uphold the dignity of each and every patient. The undergraduate nursing students participate in an interprofessional education collaborative (IPEC) rotation. Some of the nursing students along with students of other health care professions work with the homeless in a student run free day clinic. The nursing students participating at this clinic were surveyed before and after having clinical experience at the student run free clinic. The nursing students participating at the other IPEC rotation sites were also surveyed in order to compare

results with the group working at the student run free clinic. Data has been collected; however, results are pending.

CHARACTERIZATION OF EXTRACELLULAR RNA IN THE LUNG. *RAJENDRA RAVI*, VALERIA KING, MARK GILLESPIE AND GLEN BORCHERT, UNIVERSITY OF SOUTH ALABAMA.

Until recently, all types of ribonucleic acid (RNA) were thought to exist only within the cell. Excitingly, evidence now indicates that RNA can at times be secreted outside of the cell within extracellular vesicles (EVs). This RNA called extracellular RNA (exRNA) has been shown to play a role in aiding intercellular communication and regulating cellular processes. In a clinical setting, exRNA has the potential to either serve as a biomarker indicating the presence of a disease or as a targeted tool used to treat a disease. Our project marks the first time that exRNA has been isolated at University of South Alabama. Our study aims to characterize the exRNA composition found in bronchoalveolar lavage fluid (BALF) from the lungs of rats and how the exRNA composition found in BALF varies based on stressors. BALF from three experimental groups was used: 1) control 2) the effect of a high pressure environment and 3) the effect of Pseudomonas bacteria. In our study, exRNA was successfully isolated from all three samples of BALF with the addition of buffers and series centrifugation. Excitingly, we recently performed next generation sequencing of our exRNA and obtained over 15 million high quality reads for each of our samples providing us an unprecedented view of their transcriptomic profiles. Importantly, this work represents the first ever characterization of BALF exRNA compositions, and our culminating analyses are now beginning to define what types of RNAs are released by cells in the lungs, how the exRNAs released vary with stressors, and novel roles for exRNAs in immune responses of the respiratory system.

ESTABLISHING THE RELATIONSHIP BETWEEN MILD KYPHOSIS AND SELF-EFFICACY IN COLLEGE STUDENTS. *JOHN SHELLEY-TREMBLAY*, OMAR MULLA, CORAL GUBLER, LARRY GURCHIEK AND SARAH SCHRENK, UNIVERSITY OF SOUTH ALABAMA.

Mild hyperkyphosis, an abnormal forward curvature in the thoracic spine, is a common progressive deformity of the spine that affects up to 50% of older adults. Hyperkyphosis can lead to significant deterioration in health status, physical mobility, and quality of life (Katzman et al., 2016). While this disorder has been shown to contribute significantly to poor psychosocial functioning in the older adults, only one study has previously examined the link between Hyperkyphosis and psychological well-being, particularly self-efficacy. The current study measured levels of self efficacy, self esteem, anhedonia, muscular fitness, and postural stability in six (6) college students. Four of the students exhibited mild hyperkyphosis at baseline, and two were included as age-matched controls. Students are currently enrolled in 10 weeks of physical training at University of South Alabama Student Recreation Center. In young people, the Kyphosis is often referred to as ‚Äúlaptop neck,,Äù and is becoming an increasing problem for American students. Results from the baseline examination reveal that individuals with Kyphosis do not vary on physical fitness or BMI, but do exhibit higher levels of psychological tension and anxiety, and lower levels of self-efficacy. These results indicate that mild Kyphosis may be a risk factor for psychological illness and interfere with development of positive coping strategies in college students.

THE TRANSITION: DISEASE KNOWLEDGE AND TRANSITION READINESS. *JOHNSON EBONY*, UNIVERSITY OF SOUTH ALABAMA.

This study investigates disease knowledge and transition readiness in pediatric sickle cell patients. *Transition of Chronically Ill Youth to Adult Health Care: Experience of Youth With Hemoglobinopathy, by Byrant, Young, Cesario & Binder, also looked at the actual transition experience of sickle cell youth patients. The results of the study showed that the participants showed fear, anxiety, and concern about switching to an adult care provider, and they also had feeling of being pushed into this transition process. Like the example, this study also looks into the actual transition process. It focuses on the problematic areas of the transition process in the pediatric sickle cell patient. This study will be a chart review on archival data retrieved from previously completed transition readiness assessment forms. These forms were administered to the pediatric patients in the USA Pediatric to Adult Care Transition (PACT) Program. This assessment form is the official form of the Six Core Elements of Health Care Transition created by National Center of Health Care Transition. The main goal of this study is to organize this data and look at the lowest scored content such as medication knowledge, disease knowledge or life skills. The pending results will be used to develop an education packet catering to these specific problem areas. Afterwards, these packets will be given to the USA Pediatric Sickle Cell Clinic to utilize in future transition programs.

FUSION IMAGING IN ENDOMYOCARDIAL BIOPSY. *JASON OMAN* AND HANNA JOHNSON, UNIVERSITY OF SOUTH ALABAMA.

An endomyocardial biopsy (EMB) is a diagnostic procedure during which a small piece of the patient's heart muscle is removed and taken for laboratory testing. EMB is done through a catheter that is threaded into the heart (traditionally using flouroscopic guidance), after which, four to six biopsies are taken from the right ventricle.

The purpose of our study is to show that the use of high-resolution cardiac-magnetic resonance imaging (high-res C-MRI) paired with conventional flouroscopy is advantageous both for the patient and the procedural staff.

The main drawback of standard flouroscopy is the inability to differentiate between the chordae tendineae and papillary muscles of the heart and other soft tissue structures in the area. That is, without a clear visualization there is a risk of damage to the above-mentioned muscles in the process of catheterization.

Unlike flouroscopy, high-res C-MRI provides better differentiation between soft tissues, resulting in a safer procedure for the patient.

In our research, we studied literature related to flouroscopically guided EMB, C-MRI, and fusion imaging guided EMB. We also reviewed MRI cardiac studies, and, even though there is a need for further clinical research in this area to be conducted and published, we believe that the use of emergent fusion imaging techniques to overlay high-res C-MRI studies with live flouroscopy during the EMB is an improved and safer way to conduct endomyocardial biopsies.

SELF-EFFICACY AND SELF-MANAGEMENT OF CHILDREN TRANSITIONING TO INSULIN PUMPS. *ANESHA LEE*, UNIVERSITY OF SOUTH ALABAMA.

Type 1 Diabetes is a disease that requires children to become responsible for managing their health at a young age, or sooner than their peers would. These children are required to learn how to monitor what they eat, check their blood glucose multiple times a day, administer insulin, and manage episodes of hypoglycemia or hyperglycemia. These children have the option of obtaining a continuous insulin pump that may aid in the overall management of their diabetes. With this pump, the children have the ability to administer insulin at a more precise rate, which is designed to help maintain blood glucose at a consistent level. The purpose of my project is to include children ages 8-16 and evaluate the psychosocial impact that transitioning to an insulin pump has, to evaluate the adaptations made in the self-management skills, to evaluate the positive and negative implications associated with being diagnosed with type 1 diabetes, and to evaluate the perceptions of having type 1 diabetes. My hypothesis is that children who transition to a continuous insulin pump will have an increase in self-efficacy and overall self-management skills of their diabetes and have a positive change in perception of diabetes. My results are currently pending. To obtain the results, I will administer three pre- and post-questionnaires before and 2-3 months after the implementation of the insulin pump. These surveys include a 10-item questionnaire assessing baseline diabetes education, a 16-item free-text questionnaire, and a 23-item self-efficacy questionnaire. I will then compare the results of the pre- and post-questionnaires to assess the progress of the implementation of the insulin pump. During the 2-3 month time frame, I will also have follow up phone calls, not to exceed 5 times for no more than 30 minutes, with the children to assess their progress.