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# Parkview Heart Institute Telecardiology Consultation Service (PHI-TCS) Outcomes

Roy Robertson MD

*Parkview Health*, roy.robertson@parkview.com

Srilatha Dasari

George Sun

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**SCHOOL OF MEDICINE**  
FORT WAYNE

# **Student Research Fellowship Program**

**Abstract Booklet**

**August 1, 2018**

## **A Retrospective Analysis of Fall Patients and the Potential Contribution of Opioids.**

**Stephanie Adjei, BS; Jake Muha, Jana Sanders, M En;**

**Annette Chard, RN, CEN; Lisa Hollister, MSN, RN; Deborah McMahan, MD**

**Background:** The leading cause of death due to unintentional injuries amidst individuals 65 years and older is falls, and there is increasing evidence of an association between opioid use and falls in older adults. **Objective:** The aim of this study was to observe the rate at which patients admitted to trauma centers had opioids listed on their current medications list or present in their urine drug screen. **Methods & Design:** This study conducted a retrospective, descriptive, correlational study of 2,873 patients aged 15 years and older who were admitted to Allen County trauma centers as a result of a fall between 01/01/2017 and 04/30/2018. Data regarding if the patient had an opioid or benzodiazepine medication on their current medications list and if they were discharged with an opioid were gathered via chart review. The age groups were divided into two groups to observe differences between younger and older adults. Associations were evaluated via univariate and multivariate logistic regression tests. Odds ratios (ORs) were utilized to demonstrate the results with 90% confidence intervals (90% CI). Additional sub-analyses for length of stay (LOS), patient status at time of discharge, and injury severity score (ISS) were also performed. **Results:** Of all the patients who were admitted to a trauma center for a fall, 30.0% had an existing opioid prescription in their medical records. Of those that had a documented opioid prescription in their current medications list, 87.2% were in the older adult age group. Overall, older adults with an opioid prescription comprised 31.2% of the total fall population (Odds Ratio [OR]=0.71; 90% CI 0.59-0.86). **Conclusion:** This study demonstrates that the proportion of patients on opioid medications prior to their fall may have been underestimated, compared to the previous literature.

## **Neonatal Follow-Up Clinic: A Retrospective Chart Review of Developmental Outcomes.**

**Heather Wolfe, MD; Denise Gilham, NP; Haley Craig, Grant Adams, Brittni Clopton, Linda Ngo**

**Background:** Preterm birth is one of the leading causes of infant death and disability.<sup>1,2</sup> Infants that are born preterm have a greater risk of adverse health outcomes, such as neurodevelopmental delays.<sup>1</sup> Preterm birth places a significant economic strain on healthcare systems because of costly hospitalization expenses.<sup>3</sup> A multidisciplinary team coordinating an infant's health care improves the developmental outcome for the patient.<sup>4</sup> **Hypothesis:** The services provided by a neonatal follow up clinic improves the health outcomes of premature NICU patients and reduces the neurodevelopmental delays that they experience. **Methods & Design:** A retrospective chart review was conducted to determine the developmental outcome of infants that were born prior to 37 weeks gestation. Infants were divided into extreme, very, and moderate preterm categories. TIMP, ASQ, and BSID scores were used to determine if the patient had developmental delay. **Results:** The differences between TIMP 1, and TIMP 2 were statistically significant ( $p < 0.0001$ ) for moderately preterm (32-37 weeks), very preterm (28-31 weeks), and extremely preterm (<27 weeks) infants. The differences between TIMP 2 and ASQ 6/8 were statistically significant ( $p=0.02$ ). The differences between ASQ 6/8 and ASQ 10/12 was not statistically significant ( $p=0.47$ ). On average 84.4% of infants were diagnosed with a delay at TIMP 1, 55.0% of infants had a developmental delay at TIMP 2, 38.5% of infants had a developmental delay at ASQ 6/8, and 46.7% of infants had a developmental delay at ASQ 10/12. **Conclusion:** The decrease in number diagnosed with a delay from TIMP 1 to TIMP 2 to ASQ 6/8 was statistically significant for the different categories of prematurity. Early identification of delays in high-risk infants allows early intervention, leading to maximization of developmental potential.

## **Older Adults' Shared Decision-Making: Perceived Burden of Self-Care Management.**

**Grant Allbritten, Rohan Pamidi, Marwa Noureldin, PharmD**

**Background:** Older adults (65+ years old) is the fastest aging category in the United States. Large strains on healthcare systems and caregivers for this age group are occurring due to multiple factors including humans living longer with advancements in healthcare and World War II baby boomers becoming older. SDM, while becoming more popular, requires the patient and clinician to communicate in order to discuss preferences for how future medical procedures and medications should be undergone. **Objectives:** Explore older adults' preferences for shared decision-making (SDM) with family members and physicians, and to examine the association between older adults' preferences for SDM and their perceived burden of self-care management. **Methods and Design:** The data was obtained from Round 2 of National Health and Aging Trends Study (NHATS) 2012. Individuals who were identified as living in the community and adults  $\geq 65$  years of age ( $n=5640$ ) were included in this study. Analyzed measures of the NHATS included: demographics, health data, healthcare burdens, and SDM data. **Results:** Demographic analysis showed that 57.4% were female, 76.5% were between the ages of 70-79 years old, and 68.9% were white/non-Hispanic. Over half (57.2%) of patients preferred SDM with family members and 75.1% preferred SDM with physicians when compared to complete independence or dependence. Associations through multivariate analysis between SDM and patient burdens were observed in patients with either education levels, history of stroke, perceived health status, or depression. **Conclusion:** Older adults prefer SDM compared to making healthcare decisions independently or dependently relying on family members or physicians. Education levels, health status, and stroke history have associations with burdens placed on SDM patients. Future implications yield for educating caregivers and improving self-awareness of physicians involved in SDM.

## **The Impact of MyChart (ePHR) Use on the Clinical Outcomes of Behavior-Related Modifiable Health Conditions. Sam George, Seth Baker, Ashley Hanley, Nicole LaRue, Nidia Villalba, MD**

**Background:** Obesity, hypertension, type II diabetes mellitus (DM), and hyperlipidemia represent highly prevalent chronic diseases among adult Americans. Each of these diseases are associated with several comorbidities, increased risk of mortality, and collectively place a substantial burden on healthcare resources. Prior scientific studies have linked patient activation with positive lifestyle modifications. Furthermore, patients who are highly engaged in their own care have better outcomes than those who are less involved. Patient portal messaging and ePHR use have theoretical benefits, namely, encouraging patient activation, but current evidence varies on ePHR use and improved clinical outcomes. **Objective:** This study investigates whether MyChart, an electronic Personal Health Record (ePHR), can be linked to improved clinical outcomes for patients diagnosed with obesity, hypertension, type II diabetes mellitus, and hyperlipidemia. **Methods & Design:** In this retrospective chart review, we used a two-way ANOVA pairwise comparison analysis to determine whether patients' health significantly differs between patients who voluntarily use MyChart and those who do not. Our study includes patients aged 18-99 with at least two clinical visits from January 1, 2016 to May 31, 2018, and have a diagnosis of obesity, hypertension, type II diabetes and/or hyperlipidemia. **Results:** Statistical analysis revealed that there is an elevation of both body mass index (BMI), and low-density lipoprotein cholesterol (LDL) between patients who are "high-users," compared to "low-users" of MyChart ePHR, as determined by number of messages sent to their providers ( $p < 0.05$ ). These differences, however, are unlikely clinically significant. There is no statistical difference in hypertensive patients, or diabetic patients between the high-use and low-use groups. **Conclusion:** Overall, there is inconclusive evidence that ePHR use is associated with better measured health outcomes in Type II Diabetes Mellitus, hypertension, hyperlipidemia, and/or obesity.

**Parkview Health Supervised Exercise Therapy for Peripheral Artery Disease (PAD): A Chart Review. Garrett Bastin, Srikan Dasari, Michael J. Mirro, MD, FACC, FHRS, FAHA; Peter Chaille, MD, FACC, FSCAI**

**Background:** Peripheral artery disease (PAD) is the narrowing of arteries in the extremities due to atherosclerosis. The most common symptom of PAD is intermittent claudication (IC), which describes pain and fatigue in the muscles that occurs during physical activity and is relieved by rest. Supervised exercise therapy (SET) is an exercise-based therapy that demonstrates efficacy in the treatment of symptomatic PAD. SET programs consist of walking exercises in which patients alternate between walking to claudication and rest; studies indicate that it is recommended as the initial treatment to relieve IC in PAD patients. **Objective:** This study determines if the Parkview Health PAD walking program alleviates PAD-related symptoms, improves subjective quality of life, and diminishes the need for clinical intervention in patients living with peripheral artery disease. **Methods & Design:** A retrospective chart review of 10 PAD patients who enrolled in the SET program at Parkview Regional Medical Center or Parkview Randallia was conducted to assess patient outcomes and evaluate the therapeutic benefits of the newly established program. **Results:** Three of 10 (30%) patients completed the SET program, attending sessions for at least 12 weeks; none of these patients required PAD-related surgical intervention after beginning SET. Five of 10 patients required intervention prior to SET, but only one (20%) of them required a second intervention after starting SET. Following the initiation of SET, only two out of the sample of 10 patients (20%) underwent clinical interventions. **Conclusions:** Supervised exercise therapy (SET) is an effective method of treating symptoms of intermittent claudication in PAD patients. This study demonstrates a trend that enrollment in a SET program improves patient outcomes, limiting the need for surgical intervention. Greater implementation of SET in surrounding areas and increased awareness of this therapy is essential to maximize therapeutic outcomes for patients with PAD.

**Parkview Heart Institute (PHI) Postoperative Atrial Fibrillation (POAF) in Coronary Artery Bypass (CABG) and Aortic Valve Replacement (AVR) Surgery: A Chart Review. Joshua Caccamo MS, BA; Daniel Filler, Douglas Gray, MD; Michael Mirro MD, FACC, FHRS, FAHA**

**Background:** Post-operative Atrial fibrillation (POAF) is a common complication associated with cardiac operations, and it occurs due to a lack of coordination of atrial depolarization, so the AV node fires as soon as its refractory period ends. Major consequences include clot formation, stroke, and other post-operative complications. The prevalence rate of POAF is 30 to 40%, while a combined CABG and AVR procedure is as high as 60%. Patient specific factors like medical history can also indicate predictors for POAF, but age has been the most widely accepted predictor. **Objective:** Postoperative atrial fibrillation has proven to be a prevalent complication in CABG and AVR procedures. The objectives of the current study is to analyze the prevalence of POAF, examine predictive risk factors for POAF, and analyze the treatment and management of POAF, and how it affects patient outcomes. **Methods & Design:** This study was a retrospective electronic medical record chart review (EPIC) of 169 patients from June 2014, to January 2015. This project was part of a larger study that analyzed 83 data collection points per a patient and specifically analyzed the prevalence of POAF, and the comparison of POAF and none POAF for patient demographics, BMI, pre-operative medications, procedures, patient history, and complications. A two-tailed Z-test was used to analyze significance. **Results:** The prevalence of POAF was 36.09%, and the combined CABG and AVR procedure had an incidence of 35%. Preoperative medications did not show any significance ( $p > 0.05$ ) to preventing POAF. A history of atrial fibrillation, other arrhythmias, or a myocardial infarction showed to be significant ( $p < 0.05$ ) predictors for POAF. Also age was a significant indicator of POAF. **Conclusion:** This study found that the prevalence of POAF is in agreement with the national average but the combined CABG and AVR procedure has a much lower incidence rate than what is indicated in the literature. It is also in agreement that age and a history of atrial fibrillation, other arrhythmias, and myocardial infarction are indicators of POAF. Pre-operative medications do not help prevent POAF but are known to prevent other post-operative complications.

**Effect of Weight Change on Glomerular Filtration Rate in Chronic Kidney Disease Patients Stages 3, 4, & 5. Carter Chase, Alex Buchanan, Allen Maertin, DO; Brian Henriksen, PhD; Swapna Joseph MD**

**Background:** Chronic Kidney Disease (CKD) affects 30 million US adults and is defined as irregularities in kidney structure or function for more than 3 months. CKD is categorized into 5 stages of decreasing kidney function based on the patient's measured Glomerular Filtration Rate (GFR).

**Methods & Design:** The study was a case-controlled retrospective chart review examining CKD Stages 3, 4, and 5 patients, not on dialysis, and were seen within the last eight years. Records were examined to find the greatest disparity in GFR; the weight and vitals corresponding to the GFR extremes were combined to make a complete data point. 199 patients were analyzed for weight loss, 98 were analyzed for weight gain. **Results:** Stage 3 CKD patients with weight gain were found to have a statistically significant decrease in GFR (Mean: -6.55, CI: -9.49, -3.62,  $p < 0$ ). Stage 3 patients and Stage 4&5 CKD with weight loss experienced a statistically significant decrease (Mean: -4.46, CI: -6.83, -2.08,  $p < 0.05$ ) and increase (Mean: 4.11, CI: 2.09, 6.12,  $p < 0.05$ ) in GFR respectively. In patients with weight loss, there was no statistically significant difference in diuretic dosage. Stage 3 patients with weight loss underwent a decrease in diastolic (Mean: -2.34, CI: -4.57, -.11,  $p = 0.040$ ) and systolic (Mean: -6.38, CI: -10.39, -2.37,  $p = 0.002$ ) blood pressure. **Discussion:** GFR decrease in Stage 3 CKD patients with weight loss was likely due to diuretic induced dehydration as evidenced by the decrease in blood pressure. **Conclusions:** This study found that weight gain in Stage 3 CKD patients decreases GFR, thus worsening CKD. Weight loss in Stage 4&5 CKD increases GFR, thus improving CKD.

**Identification of Large Vessel Occlusion in the Prehospital Setting. Anna C. Cole, BA; Katelyn L. Gutwein, BS; Fen-Lei Chang, MD, PhD; Sara A. Brown, MD**

**Background:** Stroke treatment is time-sensitive. Therefore, it is important to be able to triage patients to appropriate stroke centers based on what type of stroke they may be having. The development of quick and easy-to-use stroke scales for use by EMS to help aid in their triage decision en route to the hospital. C-STAT is one of these potential prehospital stroke scales. **Objective:** This study aims to assess the performance of C-STAT, NIHSS, or a combination of the two in identifying LVO, and the efficacy of its use in the Northeast Indiana Regional Protocol. **Methods & Design:** This is a retrospective chart analysis, looking at all patients being evaluated for stroke between January 2017-May 2018 in the Parkview Health system. If C-STAT scores were not recorded by EMS, they were estimated using baseline NIHSS scores upon hospital arrival. **Results:** 356 patients met the inclusion criteria. C-STAT scores were recorded or estimated for 345 patients, and NIHSS scores were recorded for 324 patients. C-STAT was shown to have a sensitivity of 57.62% and a specificity of 80.32%. NIHSS of scores  $>10$  had a sensitivity of 64.81% that decreased as the cut-off score increased, and a specificity of 77.49% that increased as the cut-off score increased. A combination of C-STAT and NIHSS did not indicate a greater ability to predict LVO. **Conclusion:** Neither C-STAT nor NIHSS have both a high sensitivity and specificity, and are comparable to other stroke scales that have been assessed. However, there may be potential in investigating the individual items of the NIHSS, and using them to amend old scales or create a new scale that will have a greater ability to predict LVO in a prehospital setting.

## **Subconjunctival Kenalog Injection to Control Inflammation Post Cataract Surgery. William A. Argus, MD; Shayna Coy, Diane Frankewich, COT**

**Background:** Successful cataract surgery requires control of postoperative inflammation. Prednisolone 1% eye drops postoperatively have successfully controlled inflammation in most cases without significant side effects. We examine an alternative “dropless” surgery whereby antibiotic and Triamcinolone are injected into the subconjunctival space at the time of surgery. In a retrospective study, we studied 293 patients using postoperative drops and compared them to 283 patients with dropless surgery. We found dropless surgery as effective in controlling postoperative inflammation with very few side effects and at substantial cost savings. **Objective:** Prednisolone 1% prices have risen significantly. Ophthalmologists are looking for alternatives that are convenient and less costly. The objective of this study is to determine efficacy of the Kenalog injection in comparison to Prednisolone 1% topical drops. **Methods and Design:** The present study was a retrospective review of 576 cataract surgeries performed. Patients who were prescribed Prednisolone 1% were performed from January to December 2015. For patients who were injected with Kenalog, these surgeries were performed January to December 2017. All patients had documented preoperative, one day and one week postoperative visits. Visual acuity, intraocular pressure and anterior ocular health were assessed. **Results:** Kenalog, being a steroid, poses a threat of increasing intraocular pressure. With a p-value greater than 0.05, there is a significant difference in the mean pressures at the first postoperative visit. However, these average postoperative pressures had a difference less than 1 mmHg. However, there is statistical significance at one week. There is a minimal difference in the average intraocular pressures of the two groups ( $p < 0.05$ ). **Conclusion:** This study was successful in determining that Kenalog was as effective in maintaining intraocular pressure and inflammation. Subconjunctival Kenalog Injection to control inflammation Post Cataract Surgery.

## **Parkview Heart Institute Telecardiology Consultation Service (PHI-TCS) Outcomes. Roy Robertson, MD, FACC, FSCAI; Srilatha Dasari, George Sun**

**Background:** Cardiovascular disease is a major cause of death in the United States, and there is a growing shortage of physician specialists necessary to address this issue. Telecardiology is a form of telemedicine that allows cardiologists to treat patients from remote locations, and this form of patient care has the potential to improve both patient and economic outcomes, as well as reduce the length of patient hospitalization. The PHI-TCS was established at Parkview Huntington Hospital in September 2016 and has since been extended to additional Parkview community hospitals. **Objective:** Our objectives in this study were to evaluate the usage patterns of the Parkview Heart Institute Telecardiology Consultation Service (PHI-TCS), including rates of admission, readmission, transfer, and acute cardiac intervention, and to compare the cost of PHI-TCS to the cost of patient transfer. **Hypothesis:** The PHI-TCS improves patient and economic outcomes. **Methods & Design:** We conducted a retrospective chart review of 90 patients, totaling to 91 telecardiology encounters that were above the age of 18 and had a telecardiology consultation at a Parkview community hospital participating in the PHI-TCS in or after September 2016. We also obtained financial data and the average length of hospitalization corresponding to encounter type. **Results:** On average, when compared to standard care, patients saved \$5420 dollars and reduced their length of stay by 1.4 days when routinely discharged after PHI-TCS consult, and they saved \$541 and reduced their length of stay by 0.8 of a day when seen by PHI-TCS and transferred to PRMC. **Conclusion:** The PHI-TCS offers an economic benefit, improves patient outcomes, and reduces length of hospitalization. Provider education and standardization of PHI-TCS usage indications are areas for future research.

## **Comparison of Technical Outcomes in Instrumented Posterolateral Fusion (PLF) with and without Transforaminal Lumbar Interbody Fusion (TLIF) using Si<sub>3</sub>N<sub>4</sub> Cages.**

**Kyle Davis, BS; Lauren Jagger, Micah Smith, MD**

**Background:** The single leading cause of disability in the 45-65 year-old age group is chronic lumbar pain, which is commonly caused by degenerative disc disease (DDD). Lumbar fusion is a common treatment for recalcitrant DDD. Despite theoretical advantages of circumferential fusions, including TLIF, current literature does not provide clear evidence on whether it results in superior fusion rates over PLF. Si<sub>3</sub>N<sub>4</sub> has favorable surface properties over other interbody cages and its use may lead to improved fusion rates for TLIF procedures. **Objective:** The best surgical approach for lumbar fusion is a topic of contention, and many studies suggest no clear advantage of any one method over another. The objective of this study was to compare the fusion rates, technical outcomes, and complications of posterolateral fusion (PLF) and transforaminal lumbar interbody fusion (TLIF) using silicon nitride (Si<sub>3</sub>N<sub>4</sub>) cages. **Methods & Design:** This study was a retrospective chart review of 102 fusion procedures (PLF n=17, TLIF n=85) performed by a fellowship trained spine surgeon examining preoperative and postoperative radiographs. Outcomes measured included fusion rates, complications, and technical radiographic measurements. Radiographic measurements included segmental lordosis (SL), lumbar lordosis (LL), disc height (DH), foraminal height (FH), pelvic incidence (PI), and pelvic tilt (PT). Fusion rates and radiographic measurements were analyzed in patients who had ≥ 1 year follow up (PLF n=13, TLIF=25). **Results:** Analysis found no significant difference in fusion rates (PLF=66.7% and TLIF=80.0%; p=0.302) or complication rates (PLF=11.8% and TLIF=20.0%; p=0.733). TLIF provided significant restoration of DH (PLF=0.44 mm and TLIF=4.43 mm; p<0.001) and LL (PLF=-1.00° and TLIF=3.44°; p=0.043) when compared to PLF. **Conclusions:** Although this study showed promising fusion rates for TLIF using Si<sub>3</sub>N<sub>4</sub> cages, it was not statistically significant different from PLF. This may be attributed to the small sample size and continued data collection may provide more conclusive results.

## **Coronary Artery Calcium Scores in Public Safety Personnel. Nirupama Devanathan, Mark O'Shaughnessy MD**

**Background:** Occupational research has demonstrated that public safety personnel are prone to death by adverse cardiovascular events that are precipitated by on-the-job physiological stressors; the presence of occult coronary artery disease further increases this risk. It has been reported in literature that there is interest from public safety personnel in screening programs that could lead to counseling for possible lifestyle modifications to promote cardiovascular wellness. **Objective:** At present, there are limited guidelines to screen for occult coronary artery disease among public safety personnel, which include firefighters, police officers, and Emergency Medical Service (EMS) workers. The goal of this study is to visualize the distribution of Coronary Artery Calcium Scores (CACS) among participants in Northeast Indiana who are employed as public safety personnel, through both global analysis, among the three classes, and local analysis, within each specific class. **Methods:** In this retrospective review, the CACS of 1049 participating public safety personnel across Northeast Indiana were analyzed to understand the overall distributions in CACS for the region. The screenings in the study were conducted between 2013 and 2018. **Results:** In comparison to the general population, there was a larger proportion of public safety personnel with a CACS = 0. It was found that there were no statistically significant differences in the CACS among the three classes, firefighters, police officers, and EMS workers (p > 0.05). Moreover, there were no statistically significant differences in the CACS among the different departments within a particular class (p>0.05). **Conclusion:** In determining a demographic baseline of CACS among public safety personnel, this study demonstrate a promising role, in the near future, for Coronary Artery Calcium Screening as a standard prevention measure for public safety departments across the nation.



**Quantitative Effect of Emergency Department Case Management on Visits, Diagnostics, and Cost. Jeffrey Nickel, MD; Nancy Connelly, Cameron Duffner, Xyryl Pablo, Aelesia Hughes**

**Background:** Frequent users of the ED have been identified as a major contributing factor to over-use of EDs resulting in decreased efficiency of health care delivery and increased costs. **Objective:** In 2012, Parkview Health initiated a case management (CM) program with the hypothesis that it would reduce emergency department (ED) visits, radiation exposure, and costs for patients who had visited a Parkview ED 5 or more times within 6 months. **Methods & Design:** This retrospective case series involved examining medical records of 460 CM patients from 2011 to 2018, recording the amount of Parkview ED visits, diagnostic tests, and affected cost accumulated in the year prior to CM enrollment compared to each of the next 2 years. Demographics, chief complaints, diagnoses, psychiatric and drug use history, and whether the patients had insurance and a primary care provider were also recorded. Patient data was excluded if the patient was younger than 18 at the time of CM enrollment, had not yet completed 2 years in the CM program, or if medical records were not available. ANOVA and 1-sided, paired t-testing were performed to evaluate significance of the results. **Results:** Comparing the year before enrollment to the 2<sup>nd</sup> year after, ED visits were reduced from 5,264 to 2,012 for 378 patients (63%,  $p < 0.01$ ), the affected cost was reduced from \$551,734.45 to \$246,248.34 for 299 patients (55%,  $p < 0.01$ ), and the number of diagnostic tests was reduced from 6,040 to 1,883 for 104 patients (69%,  $p < 0.01$ ). **Conclusion:** Patients enrolled in Parkview's CM program showed statistically significant reductions in ED visits, radiologic exposures, and affected costs over 2 years, with implicit improved health outcomes. Projected 10-year affected cost savings range from \$3.7 million to \$9.1 million.

**Prevalence of Opioid-Related Deaths with Previous Naloxone Encounters in Allen County, Indiana: A Chart Review. Thomas Dykstra, MD, Jen Knapp, Ian Gatchell, Kristin Lytal**

**Background:** Across the United States, the abuse of opioids is rapidly increasing, with Southern and Midwestern states experiencing the highest mortality rates. Many physicians have followed the "pain as a fifth vital sign" movement, accounting for the increased amount of controlled substance prescriptions. The prescribing of opioids became increasingly monitored upon the realization of their abusive patterns. As a result of this close monitoring, patients began to turn to alternatives, such as heroin and fentanyl. Naloxone, a mu receptor antagonist, is extremely effective in reversing the effects of an opioid overdose. **Objective:** The objective of this research was to see if the study population follows national trends regarding opioid deaths, including heroin and fentanyl deaths. Additionally, the study aimed to examine the role of benzodiazepines in opioid deaths, and finally to determine the proportion of deaths that were of patients with a previous naloxone encounter. **Methods:** This study was a retrospective chart review using Three Rivers Ambulance Authority (TRAA) data spanning from January 2010 to December 2017, while Parkview Health (PH) data encompassed February 2013 to December 2017. Additional data was provided from the Allen County Department of Health encompassing January 2010 to December 2017. **Results:** In the study population, there was an increased number of total opioid deaths, including heroin and fentanyl deaths. Opioid/benzodiazepine combination deaths decreased significantly between 2016 and 2017 ( $P$ -value=0.0080). The majority of opioid-related deaths between 2010 and 2017 were patients with no previous naloxone encounters ( $P$ -value<0.0001). Annually, in 2010, 2.94% of opioid-related deaths were of patients who had a previous naloxone encounter, but in 2017 this increased to 22.0%. This was a statistically significant increase ( $P$ -value=0.01). **Conclusion:** Public Health efforts should be tailored towards this population, specifically after their first naloxone encounter. This would have the potential to positively impact the opioid epidemic in Allen County.

**Interferon Beta as a Novel Therapeutic Agent for the Treatment of Ischemic Stroke. Jui-Hung Yen, PhD; Ping-Chang Kuo, PhD; Barbara A. Scofield, BS; Alexander Intriago, MArch; Lauren Watson.**

**Background:** Currently the standard treatment for ischemic stroke is the application of tPA within a 3h time window. However, delayed tPA treatment increases the risk of blood-brain barrier (BBB) destruction and of cerebral hemorrhage. In addition, tPA does not offer protection against neuroinflammation in ischemic stroke. We propose to repurpose use of IFN $\beta$ , an FDA approved treatment for multiple sclerosis, for ischemic stroke treatment, and our central hypothesis is that the co-administration of IFN $\beta$  with tPA will suppress ischemia-induced neuroinflammation and extend the therapeutic window of tPA. **Objective:** We investigated the effect of IFN $\beta$  on the amelioration of neuroinflammation and IFN $\beta$  co-administered with tPA on the extension of tPA therapeutic window in ischemic stroke. **Methods & Design:** We used a transient middle cerebral artery occlusion (tMCAo) animal model of focal cerebral ischemia. Ischemic brains were harvested to determine infarct volume. Mononuclear cells were isolated from the ischemic brain to determine the CNS infiltration of peripheral immune cells. Delayed tPA treatment-induced BBB disruption and cerebral hemorrhage were also determined. **Results:** A statistically significant reduction of infiltration was noted with the use of IFN $\beta$ . This reduction included a marked decrease in the amount of neutrophils during the sub-acute phase. Additionally, the permeability of the BBB was impacted to a lesser degree with the addition of IFN $\beta$  and a strong correlation between BBB breakdown and MMP-9 expression was found. **Conclusions:** Our preliminary results demonstrate that IFN $\beta$  ameliorates neuroinflammation and lessens delayed-tPA induced BBB disruption and cerebral hemorrhage.

**Cryotherapy Ablation Therapy for the Treatment of Esophageal Cancer: A Retrospective Review. Neil R. Sharma, MD; Ibrahim Omar, Nicole L. Eckert, Jayakrishnan Krishnakurup, MD; Christina M. Zelt, MSN, RN; Saurabh Gupta, MD**

**Background:** Esophageal cancers are the sixth leading cause of cancer mortality and eighth most common cancer overall. The traditional therapies for esophageal adenocarcinoma are limited by adverse events. Cryoablation is a novel endoscopic technology and previous studies have demonstrated its lasting benefits and safety. **Objective:** The aim of this study is to evaluate the efficacy and safety of cryotherapy in the treatment of esophageal adenocarcinoma. **Methods & Design:** This study is a retrospective, single center chart review of 29 patients who had cryoablation procedures performed from 2013 to 2018. The subjects received cryotherapy ablation as an adjuvant, neoadjuvant, or palliative treatment. Basic descriptive calculations were computed and data analysis was performed using a two-tailed t-test to analyze remission and regression versus the stage of adenocarcinoma. **Results:** The study consisted of 26 males and 3 females with a median age of diagnosis of 72 years. The subjects underwent a total of 172 cryoablation treatments, with a median of four treatment cycles per person. Minor adverse events were seen in 51.7% of cryotherapy subjects. The regression rate between stage 0 and I adenocarcinoma and the remission rate between stage II and III were significantly different based on a two-tailed t-test ( $p < .05$ ). **Conclusion:** This study demonstrated cryoablation to be a safe and effective treatment for esophageal adenocarcinoma, as only minor side effects and few complications were found. The data collected was extensive and standardized, yet limitations arose regarding lack of a control group and small sample size. Larger studies are needed to confirm these findings and better evaluate this treatment option.

## **Incidence of Viral Hepatitis C in Northeast Indiana.**

**Kori Ormachea, Ariana Cranston, Kassidy Beck, MS; Teresa A. Beam PhD**

**Background:** The hepatitis C virus (HCV) now impacts over 3.5 million people in the United States and can lead to the onset of cirrhosis, chronic liver inflammation, liver failure, and hepatocellular carcinoma. Often asymptomatic, infected individuals can spread HCV through blood unknowingly. HCV incidence, especially occurring in individuals born after 1965, serves as a surrogate indicator for intravenous opioid use. In this study, we examined incidence of new onset HCV positive patients in northeastern Indiana. **Methods & Design:** A retrospective chart review was completed on patients that tested positive for HCV within the Lutheran Health Network between 01/01/2012 to 12/31/2016. Zip code at first positive HCV test was used to geo-map incidence of HCV in specific counties of northeastern Indiana. Other data collected included: birth date, gender, age at first positive, current age, date of first HCV positive test, type of qualitative and/or quantitative HCV test, genotyping results, co-infection with HIV, insurance type, antiviral medication prescribed, liver AST, liver ALT, and liver fibrosis score testing. **Results:** Highest incidence of HCV was found in the counties of Allen and Wabash. The highest incidence per capita was in Allen County with five different zip codes containing 25-30 positive HCV tests between 2012-2016. There was an increase in the number of cases from those born after 1965, with the most dramatic increase from 2014 to 2015. More men than women tested positive for HCV in our dataset. HCV genotype 1a was most prevalent followed by type 1b and type 3. **Conclusion:** By using the zip code level geo-mapping, healthcare and state officials can more specifically identify incidence of HCV infection in their community. This can allow public health officials to implement prevention, education, and other interventional practices to lessen the burden of HCV.

## **Opioid Prescriptions for Elective Surgical Patients: Prescribing Habits in 2015 vs. 2018 and Patient and Physician Perception. Neal Agee, MD; Xyryl Chriscella Pablo, BS; James Sullivan, BS**

**Background:** Between 2014 and 2017, there has been a reduction in outpatient opioid prescribing. However, the problem of opioid related deaths remains a significant issue in the US today. The opioid epidemic has become a national discussion, reaching the height of physician focus in 2015.

**Objectives:** The focus of this study was to note whether opioid prescribing habits for elective surgeries have changed in 2015 when compared to 2018. The type of pain medication prescription used was recorded and compared between the two times. The next phase of the study involves questionnaires evaluating patient and physician perceptions of the opioid crisis. **Methods & Design:** To observe opioid prescribing habits in 2015 vs. 2018, a retrospective medical record review was conducted for 50 patients from each time point, following total hip replacement. Further noted was the pain management given, surgeon, patient age, and patient sex. Postoperative elective surgical patients aged 18-99 years old were included and pregnant patients were excluded. Questionnaires were prepared for future use with patients and physicians to evaluate opioid perceptions. A two-sided unpaired t-test was utilized to check for statistical significance. **Results:** From 2015 to 2018, for 50 patients each, there was a 23.33% decrease of any opioid containing prescriptions and a 176.92% increase in any prescriptions for non-narcotics ( $p < 0.05$ ). Drugs classified as Single opioid + non-narcotic had the greatest increase of 600% (with none having undefined percentage increase) while Double opioid combination had the largest decrease of 100% ( $p < 0.05$ ). **Conclusion:** Opioid prescribing habits in 2015 vs. 2018 following total hip replacement demonstrate a significant decrease in narcotic and increase in non-narcotic containing prescriptions. With current data and future questionnaires, we aim to establish a study analyzing the effectiveness of a shared decision-making program in reducing opioid prescription in post-operative elective surgical patients.

## **Comparison of 2 Techniques Using EUS Guided Liver Biopsies Via 19 Gauge Core Needle to Obtain Optimal Core Specimen in Benign Disease (BLOCS - Benign Liver Optimal Core Study).**

**Brad Rumancik, PharmD; Sharwani Kota, Judy Irvin, RN, CCRC; Christina Zelt, RN, MSN; Michael Mirro, MD, FACC, FACP, FAHA, SVP; Neil R. Sharma, MD**

**Background and Objective:** Endoscopic ultrasound (EUS) guided fine-needle biopsy (FNB) to obtain core liver specimen has been shown to be effective and safe. However, prospective data is limited regarding EUS-FNB in non-malignant liver disease. The objective of this study is to evaluate two EUS-FNB techniques, modified wet suction (MWS) versus slow pull (SP), in patients with non-malignant liver disease. **Methods:** In this prospective, randomized controlled trial we are evaluating efficacy and safety of EUS-FNB techniques (MWS versus SP) using a 19-gauge needle in patients with initial indication for an upper endoscopy plus need for a liver biopsy to assess non-malignant disease. The primary outcome is pathological yield defined as number of complete portal tracts (CPTs), specimen length, and fragmentation. Secondary outcomes include pathological yield between two separate specimen processing techniques, pathological yield between left versus right liver lobe biopsy, time for biopsy technique, and complications 1 week post-biopsy. **Results:** For this interim analysis, 8 patients (5 received MWS and 3 received SP) out of a projected total of 360 patients are enrolled. Independent t-test analysis reveals no statistical difference between CPTs ( $P=0.56$ ), specimen length ( $P=0.12$ ), and fragmentation ( $P=0.16$ ). No differences are found between any secondary outcomes, and there have been no complications attributed to the biopsy.

**Conclusion:** This underpowered interim analysis reveals no statistical difference in primary or secondary outcomes between MWS versus SP technique. The current results for both groups are consistent with specimen adequacy criteria determined by American Association for the Study of Liver Disease.