2021

2021 Student Research Fellowship Program: SERF ABSTRACT Booklet

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2021 SERF Abstracts

A Comparison of Outcomes Between Laparoscopic and Robotic Appendectomy Among ACS NSQIP Hospitals

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Background/Objective: Robotic general surgery remains controversial with some employing the technology for common laparoscopic procedures such as appendectomies. Very few studies have compared robotic appendectomies to existing techniques, partly due to the relative scarcity of data. The purpose of this study was to compare outcomes for robotic appendectomies versus laparoscopic appendectomies. **Methods:** This retrospective cohort study evaluated procedural specific databases of ACS-NSQIP for appendectomy between 2016-2019 (inclusive). Demographic and surgical outcomes including composite 30 day complications, specific complications, and length of operation were analyzed using a univariant analysis. **Results:** There was no difference in the total number of comorbidities present or the severity of appendicitis (perforation/abscesses) between robotic and laparoscopic cases. Robotic appendectomy had a longer operation time (91 min vs 52 min, $p < 0.001$) but a shorter post-operative stay (0.66 days vs 1.27 days, $p < 0.001$). There was no difference in the frequency of 30-day mortality ($p = 0.34$), readmission ($p = 0.20$), or complications ($p = 1$) between robotically performed appendectomy and laparoscopic appendectomy (Table 1)

Complications	Laparoscopic N = 49,800	Robotic N = 50	P Value	Odds ratio
Any Complication	5302 (10.6%)	5 (10%)	1	1.06
Superficial surgical site infection	423 (0.8%)	0	>0.9	
Organ Space SSI	1,355 (2.7%)	0	>0.9	
Postoperative Intra-abdominal Abscess	1353 (2.7%)	0	>0.9	
Sepsis	1,696 (3.4%)	1 (2%)	>0.9	1.7

Table 1. Complications for Laparoscopic versus Robotic appendectomy.

Conclusion and Potential Impact: Our results demonstrated laparoscopic and robotic appendectomy had a similar frequency and profile of complications. Robotic procedures took longer but resulted in shorter post-operative stays. Robotic appendectomies appear promising but at present, only make up a small fraction of cases (0.1%) and the widespread adoption of robotic appendectomies is difficult due to issues of cost, equipment, and training.

Post-COVID-19 Fatigue: Demographic Distribution and Relation to Chronic Illnesses

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Objective: This retrospective study examined the relationship between post-COVID (PC) fatigue and the presence of chronic illnesses. **Materials and Methods**: Electronic health records of 122 Parkview PC Clinic patients were reviewed for demographics (age, gender, race), chronic illnesses (diabetes, hypothyroidism, hypertension, congestive heart failure, anemia, cancer, orthostatic hypotension), obesity (weight, BMI), complaint of fatigue, and activities affected by fatigue. Data was analyzed using Chi-square tests for categorical variables (or Fisher's exact test for small cell sizes) and t-tests for continuous variables. Open thematic coding of activities most affected by PC fatigue was performed. **Results:** 95 out of 122 patients (77.9%) were found to have PC fatigue. Except for measures related to obesity, none of the chronic illnesses assessed were correlated with the presence of fatigue. The weight of PC fatigue patients was significantly higher than those without fatigue (p=0.04). Examination of BMI and obesity status also indicated significantly higher BMI (p=0.01) and levels of obesity (p=0.004) in PC fatigue groups. No significant differences were observed between the groups in either PT test. Examination of patient described activities effected by PC fatigue found work (30.4%), daily stamina (28.6%) and ability to exercise (16.7%) most impacted by PC fatigue. Other activities affected by PC fatigue included housework (5.6%), hobbies (3.7%), shopping (1.9%) and driving (1.9%). **Conclusion**: 77.9% of our PC patients showed symptoms of fatigue. This is comparable with existing literature. None of the demographic variables and PT tests, or most of the chronic health conditions investigated, were correlated with the presence of fatigue in PC patients. In contrast, measures associated with obesity, including high BMI and weight, were significantly associated with increased PC fatigue presentation. Open thematic coding of qualitative variables indicated work, daily stamina, and exercise were most affected in PC patients.

Immunotherapy Followed by Consolidation Chest Radiation in Unresectable Locally Advanced Non-Small Cell Lung Cancer that is Not Amenable to Chemoradiation

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Background and Hypothesis: Survival for non-small cell lung cancer (NSCLC) remains poor. Concurrent chemoradiation has been standard of care for unresectable stage III NSCLC due to increased survival and decreased progression, but patients with poor performance status (PS) cannot tolerate chemotherapy toxicity well. Pembrolizumab, an immune checkpoint inhibitor targeting the programmed death receptor-1 (PD-1) / programmed death-ligand 1 (PD-L1) axis, demonstrated efficacy through several randomized clinical trials as a monotherapy in the treatment of NSCLC tumors with high PD-L1 expression and in combination with chemotherapy / radiotherapy for metastatic disease. However, the literature lacks studies regarding immunoradiotherapy for patients with locally advanced NSCLC and poor PS. We hypothesize immunotherapy and radiotherapy without chemotherapy may provide good disease control and tolerability in unresectable stage II-III NSCLC that cannot be treated with chemoradiation.

Methods: Through this retrospective case series, we analyze the electronic medical records (EMR) of adult patients diagnosed with stage II-III NSCLC at Parkview Health (PH) from 2019-2021 and treated initially with pembrolizumab plus sequential consolidation chest radiation (CXRT). Tumor pathology, clinical stage, and PD-L1 expression were recorded. Tumors were restaged from baseline via computed tomography (CT) scan to determine response using Response Evaluation Criteria in Solid Tumors version 1.1 (RECIST 1.1). **Results:** Four cases of stage IIIA squamous cell carcinoma (SCC) responded well to combination therapy, with one achieving target lesion reduction classified as stable disease (SD), two achieving partial response (PR), and one achieving complete response (CR). One stage III adenocarcinoma case developed progressive disease (PD) with brain metastasis. One stage IIB SCC case demonstrated initial target lesion reduction with pembrolizumab but deteriorated with COVID-19. **Conclusion and Potential Impact:** This case series suggests that pembrolizumab plus sequential CXRT may provide benefit for stage III NSCLC patients with high PD-L1 expression. Additional studies are needed to confirm this hypothesis. **Keywords:** Non-small cell lung cancer • Pembrolizumab • Consolidation chest radiation • Poor performance status

The Attitudes, Perspectives, and Barriers Among Primary Care Physicians Towards Addressing Sexual Health of Perimenopausal-Aged Women

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Background/Objective: Menopause is the natural cessation of menstruation that typically occurs in women between ages 45 and 50. Menopause can lead to numerous issues regarding sexual health such as vulvovaginal atrophy, low desire, issues with vaginal lubrication, and an inability to achieve climax. Despite these issues, very few physicians initiate conversations about sexual health. Female patients generally feel uncomfortable bringing up the topic without first being asked by their physicians, so it is imperative to assess the reasons why physicians rarely discuss the topic.
Methods: Sixteen semi-structured interviews were conducted with family medicine physician faculty and residents regarding barriers to discussing sexual health with their patients. Interviews were transcribed, reviewed, and coded for common themes. Generalizable categories were identified from these themes.
Results: Patient embarrassment and cultural/religious norms were the most stated barriers to discussing sexual health. Adherence to norms and the lack of sexual education among patients were the most stated potential reasons for these barriers. The use of standardized questions and increasing efforts to directly discuss sexual dysfunction were the most stated potential solutions to these barriers. Better medical education regarding female sexual health and developing routines to ask about sexual health were the most stated strategies to help family medicine physicians to better serve this population.
Conclusion and Potential Impact: This study established, from a family medicine perspective, the barriers and respective potential solutions towards improving the sexual health of women of menopausal age. Patients with suboptimal sexual health can affect other aspects of their health. If barriers to discussing this topic with patients can be reduced, more sexual dysfunction diagnoses can be made, and family medicine physicians can better guide and treat patients to resolve these issues and improve overall quality of life.

Rates of Ischemia Amongst Asymptomatic Patients with High Coronary Artery Calcium Scores

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Coronary Artery Calcium Scores (CACS) may be used to recommend lifestyle changes or other treatments to reduce the risk of heart disease. The incidence of asymptomatic ischemia in patients with elevated CACS is poorly defined. Furthermore, the CACS cut-off above which it is clinically important and cost effective to look for and diagnose ischemia is also not well defined. The purpose of this study is to better define the incidence of asymptomatic ischemia in Parkview Heart Institute (PHI) patients with elevated CACS, including an examination of demographic data that may also influence the rate of ischemia. 118 Patients who were screened for Coronary Artery Disease, received CACS ≥ 400, and subsequently had stress testing or invasive coronary angiogram within 6 months were admitted into the study. Through statistical analysis it was determined there was no statistical difference in rates of ischemia between patients with CACS of 400-999 and those >1000. However, due to a small sample size this study will be continued to strengthen its results and investigate if demographics play a role in rates of ischemia.

Community-based Study on Hip Fracture in a Rural Area in Northeast Indiana

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Background/Objective: There are few studies in the literature focused on rural hip fracture epidemiology, and fewer still that consider hip fractures at a specific county level or trauma center (TC) region. The aim of this study is to elucidate patterns of injury events and injury burden of hip fractures in a rural trauma center in northeast Indiana. **Patients and Measurements:** We ascertained 2019 hip fracture cases that consisted of three sets of data, namely, emergency department visits (ED), hospitalizations (IP), and deaths from clinical databases. We analyzed the cases by fracture type, measured incidence rates (IRs) per 1,000 county residents and described the injury pattern of hip fractures by variables such as county of residence, age, and sex. We considered the mechanism of injury (cause) of the fractures as well as the injury burden based on the above three sets. **Results:** A ratio of roughly 2:1 was found for extracapsular to intracapsular hip fractures. Injury patterns showed that the study counties had similar incidence rates with a range of 0.96 to 1.41 per 1,000 residents. Males and females ages 0-69 years had similar incidences of hip fracture. Overall, females had a 41% higher incidence rate of hip fractures than males. Injury burden indicated a similar distribution of ED to IP to mortality cases across the five study counties, and the majority (98.4%) of hip fractures with known causes of injury were due to falls. **Conclusions and Potential Impact:** We elucidated the injury patterns and burden of hip fractures in a verified level II trauma center region. The results of this study have the potential benefit for the future development of hip fracture prevention programs for rural, elderly populations in northeast Indiana.

A Comparison of the Accuracy of WATCHMAN and WATCHMAN FLX Device Sizing between CT, TEE, and Patient Specific 3D Models

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Background and Hypothesis: In patients with Atrial fibrillation (AF), the Left Atrial Appendage (LAA) is the most common site of thrombus formation. The LAA occlusion procedure using the WATCHMAN device implant is an alternative for stroke prevention in AF patients. Transesophageal echocardiogram (TEE) and Computed tomography (CT) scans aid in measuring the LAA to predict implant device sizes. However, due to varying LAA anatomy and limited spatial resolution, the current imaging techniques often predict one of two sized devices. The objective of this retrospective study is to compare the accuracy of measurements made preoperatively of the LAA with those on 3D models to determine if they can be used in preoperative planning. We hypothesize 3D models will be more accurate in predicting device size and any anatomical impediments than traditional TEE planning. **Project Methods**: There were 21 subjects selected who underwent the WATCHMAN FLX procedure at Parkview Heart Institute in 2021. 3D models of LAA were created from CT scans using a Form 2 3D printer. The device sizes predicted for the procedure were determined from Boston Scientific FLX guidelines based on the maximum LAA orifice diameter from TEE, CT, and 3D models. **Results**: Two-proportion z-test between the 3D model predicted sizes to the actual size deployed demonstrated no statistical significance (p=0.298) demonstrating no difference between 3D model predicted sizes and actual size deployed. Two-proportion z-test between TEE vs actual size and CT vs actual size demonstrated statistical significance, suggesting a difference between the group's predictions. 3D models predicted the accurate device size for 20/21(95%) subjects. TEE measurements of maximum orifice diameter were, on average, lower compared to CT and 3D model measurements. **Conclusion and Potential Impact**: 3D printed models provide the most accurate device size predictions and can be used to optimize presurgical planning while reducing intraoperative complications.

Effective Telehealth – Open Heart Readmissions

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Background: The purpose of this study is to compare open heart surgery (OHS) Telehealth patients (TP) and non-Telehealth patients (NTP) using outcomes data such as hospital readmission, emergency department (ED) presentations, observation hours, and office visits. Visits for atrial fibrillation (Afib), pleural effusions (PE), and sternal wound complications (SWC) are of particular interest for this study. **Methods:** A retrospective chart review of 110 patients above 18 years old who had OHS at Parkview Heart Institute from 2020 were assessed using hospital readmissions, ED presentations, observation hours, and office visits outcomes. Separate forms for blinding, demographic data, and surgery information were completed for every patient. A Telehealth form was completed out for every Telehealth intervention had per TP. An outcomes form was completed for each outcome had by each patient. TP outcomes were compared with NTP outcomes. Fisher's exact test and X_2 was used for statistical analysis (p=0.05). **Results:** Results display a sample size of the total patient population (110/436). There was no significant difference found between NTP and TP in terms of office visits (79.5% vs 93%, p=0.598), readmissions (3 vs 6, p=0.889), and observation visits (0 vs 3, p=0.558). Significance was found between NTP and TP in terms of ED visits (0 vs 9, p=0.025). Most

frequent reason for NTP readmission “other” (7.7%) and TP “other” (4.2%), reason for ED visit for NTP (all 0%) and TP “other” (7.0%), reason for observation visit for NTP (all 0%) and TP “other” (1.4%), reason for office visit for NTP “other” (76.9%) and TP “other” (91.5%). **Conclusion:** TP presented to the ED significantly more than NTP. The largest outcome category was “surgery follow up” office visits listed in the “other” section. Data collection and analysis are in progress. At the time of writing this abstract, final results are not yet available.

Why Should I Take My Medicine? A Review Of ED Visits For Seizures.

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Background and Hypothesis: The costs of anti-epileptic medication (AED) and poor care coordination result in increased Emergency Department (ED) visits for seizure events and produce both direct and indirect economic burdens on patients with frequent seizures. **Project Methods:** A retrospective chart review study of ED visits with chief concern of seizure from two hospitals over a two-year period was performed; resulting in 152 visits recorded in this study. Data collected included demographic information, relevant seizure or past medical history (PMH), diagnostics performed in the ED, and the admission status of the patient along with the total charges per encounter. Data was analyzed descriptively and with logistic regression analysis. **Results:** The results yielded by this study were generally in-line with the results of similar studies, indicating a higher relative rate of ED seizure visits for males, people of Black race, and infant and toddler populations. A high proportion of Medicaid/Medicare coverage and indiscernible employment status for most patients were also noted. Observed differences in average cost among patients with and without epilepsy and male versus female patients were not shown to be statistically significant. However, the increased likelihood of admission with increasing age was shown to be significant with an average age difference between admitted and discharged populations of approximately 10 years ($p = 0.003$). **Conclusions:** The data provided here is not sufficient to examine the complex relationship between seizures, epilepsy, and costs among various other patient factors. Further study is necessary to minimize direct and indirect costs of seizures.

Lutheran Hospital Neonatal Follow-Up Clinic (NFC): Developmental Delay of Preterm Cohorts as a Function of Gestational Birth Age

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Background and Objectives: With improvements in NICU care and technology, premature births have risen steadily. As more of the population is born preterm, it is important to understand the long-term associated consequences and risks, such as physical and mental developmental delay. As a result, we intend to investigate the risk of developmental delay as a function of gestational preterm birth age. **Methods:** This longitudinal; study included data collected from Lutheran’s NICU Follow-Up Clinic (NFC) from July 2015 to June 2021. Developmental delay was assessed using the Test of Infant Motor Performance (TIMP) and the

Ages and Stages Questionnaire (ASQ). 720 patients were screened for ASQ or TIMP participation, of which 175 premature participants were included and assed using gestational preterm cohorts. ASQs and TIMPs were also collected for other adverse birth-related diagnoses to serve as comparators (n = 173). **Results:** For TIMP 1, the delay percentage for each cohort is as follows: extremely preterm (65.9%), very preterm (55.9%), moderately preterm (53.8%), and late preterm (37.5%). Delay percentages for TIMP 2 were 54.8%, 56.5%, 45.5%, and 50%, respectively. By using weighted chi-square analysis, the results were not significant (TIMP 1 [p = 0.436]; TIMP 2 [p = 0.925]). Preliminary ASQ data for preterm cohorts, as well as TIMP and ASQ screenings for adverse birth-related categories, were collected but not analyzed statistically.**Conclusion:** Currently, not enough data has been collected to make a concise and complete argument for or against gestational-age-related developmental delay. Continued longitudinal screening and larger population sizes are needed for future statistical analysis and correlational discourse. In the future, a full-term cohort control would serve as a useful baseline measurement. Moreover, continued inclusion of the other birth-related events will allow for meaningful comparison between environmental and physical factors on development.

Investigating Barriers and Facilitators of Intimate Partner Violence Screening in Perinatal Care

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Background and Objective: Intimate partner violence (IPV) is physical, sexual and psychological abuse, and controlling behaviors perpetrated by a current or former partner or spouse and can compromise maternal and neonatal health if occurring during the perinatal period. Standardized IPV screening has not been universally implemented in pregnant populations. This study aims to assess the current state of IPV screening in perinatal facilities within Parkview health. **Methods:** Five maternal healthcare providers were recruited for semi-structured interviews assessing the current IPV screening practices. Interviews were recorded and transcribed. Transcripts were qualitatively analyzed via the framework method, applying an inductive approach. Themes focused on the processes associated with IPV screening within the Women's and Children's service line at Parkview Health.
Results: Participants described having minimal access to data associated with IPV and related patient outcomes. Barriers to screening include time constraints and concerns about their relationship with their patients (e.g., judgement). IPV screening occurs at least once during the pregnancy, though frequency and timing is variable. Participants were unaware if IPV screening tools being used are validated instruments. Screening for other social determinants of health (e.g., housing) have a higher priority over IPV. Participants favor standardization of IPV screening, but fear patient narratives will be lost if screening is reduced to a checklist.
Conclusion and Potential Implications: IPV screening in pregnant women is not standardized at Parkview, which is common in healthcare according to the literature**.** Given the impact of IPV in pregnancy, a standard approach to screening may lead to improved maternal and neonatal health outcomes. Our findings suggest that IPV screening can be improved by increasing clinician access to patient outcomes data, adopting a team-based approach that incorporates trusted non-clinical staff, and developing organization-specific guidelines for screening frequency and prioritization and follow-up for positive screens (e.g., resources, referral process).

Difficult Airway Response Team (DART): A Novel Approach in a Non-Academic Level Two Trauma Center

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Background: Complications related to emergent difficult airway crises can be significant and life threatening. Several academic hospitals have established organized response programs to effectively respond to these emergencies. This study examines the implementation and outcomes of a difficult airway response team in a non-academic, level two trauma center. **Methods:** Morbidity and mortality statistics, patient characteristics, and response team performance data were collected for difficult airway cases over a 15-month retrospective period. Outcomes data was compiled, and provider feedback was evaluated for improvement opportunities. **Results:** Of the 38 difficult airway patients, 18 were obese (47%) and 27 (71%) had at least one predisposing risk factor. The ICU saw 23 (60%) events, and the day shift saw 25 (66%) events. Zero deaths and sentinel events were reported in association with DART intervention. Where data was available and applicable, median (IQR) time to airway was 10 (16) minutes among all successful DART activations and 13 (10.5) minutes when DART members were successful. Median (IQR) non-surgical airway attempts was 2 (1) among all successful DART activations and 1 (0) when DART members were successful. Excluding missed and cancelled DARTs, team member comments involving documentation or delay were present in 19 (73%) and 12 (46%) cases, respectively. **Conclusion:** Morbidity and mortality statistics, along with response time data, reflect the successful implementation of a hospital-wide DART program in a non-academic setting. Future efforts will focus on pre-identification of difficult airway patients and feedback-based program improvement initiatives.
Keywords: Difficult airway response team; difficult intubation; outcomes; airway emergency

The Effects of Integrative Palliative Oncology on Hospital Time, Hospice Referrals, and Advanced Care Planning

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Background: Integrative palliative oncology incorporates mental, physical, and familial aspects of care into standard cancer treatment. Patients in these programs have access to a doctor, nurse, psychologist, social worker, and chaplain who are all trained in palliative oncology whereas standard oncology does not have this team. Integrative programs improve well-being while reducing futile treatments. We hypothesize that emergency department (ED) visits, inpatient admissions, intensive care unit (ICU) stays, hospital deaths, hospice referrals, and advanced care planning (ACP) are affected by these programs. **Methods:** A retrospective chart review analyzed patients from Parkview Regional Medical Center. Cohort A included 100 patients from a palliative oncology program. Cohort B included 100 patients who received standard oncology care. Cohorts were matched on gender, age, cancer type, and stage. Number of ED visits, ICU admissions, and inpatient stays were analyzed. Hospice referrals, hospital deaths, and ACP documents were also compared. **Results:** A T-test showed no difference between ED visits, ICU stays, or inpatient admissions between cohorts. A chi-square analysis also showed no difference in hospice referrals or hospital deaths. However, there were

significantly more ACP documents on file for cohort A (p = 0.000132). This suggests that palliative oncology programs do not strongly affect hospital time or hospice referrals but may impact advanced care planning. **Conclusion:** Since the benefits of palliative oncology programs do not seem related to hospital time or hospice care, another factor must be responsible for improving patients' quality of life. These programs emphasize family involvement and planning thus explaining the significant increase in ACP documents. Perhaps this extra support and preparedness also improves patients' moods and well-being. **Impact:** Future studies should involve a larger sample size and focus on psychological aspects of these programs to determine why they benefit patient health, specifically mental health, and what improvements can be made.

Impact of Gabapentin and Pregabalin on Neurological Outcome After Ischemic Stroke

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Background: The purpose of this study is to determine whether patients taking either gabapentin or pregabalin at the time of their stroke injury tend to have better outcomes than patients with similar injuries who were not taking one of the two medications. Prior studies have shown a potential neuro-protective effects of these two medications.
Methods: A retrospective chart review of 115 ischemic stroke patients from 2016-2021 were assessed for patient outcomes using two tools, the NIH Stroke Scale (NIHSS) and the modified Rankin Scale (mRS), in addition to their hospital length of stay. The outcomes of patients taking either gabapentin or pregabalin with stroke diagnoses are compared to patients with stroke diagnoses who were not taking either medication. Kruskal-Wallace and X^2 were used for statistical analysis. **Results:** There was significantly larger proportion of gabapentin patients that improved compared to patients in the control group when using the mRS tool for patient outcomes (X^2; p=0.015). The gabapentin group showed a significantly larger improvement in the NIHSS scores from admission to discharge (Kruskal-Wallace; p=0.0005). Patients on gabapentin had a longer hospital stay than those not taking the medication by 1.7 days (t-test; p=0.041). **Conclusion:** Our data support the potential neuro-protective effect of gabapentin/pregabalin with improved outcomes after an ischemic stroke using two parallel outcome measures of NIHSS and mRS scores. Of interest, patient hospital stays were longer on gabapentin/pregabalin, which may contribute to the improved outcomes. We need larger subject groups to confirm and further study our findings. This often can be facilitated by studies involving larger medical practices, insurance, or payer databases. In addition, impact of associated cost and care quality issues such as nosocomial infection and fall risk can be considered in the context of healthcare integration and value-based care emphasizing quality and cost management.