

initiation. DISCUSSION/SIGNIFICANCE OF IMPACT: The immunological profile of children with B-ALL and factors influencing their susceptibility to infection are still incompletely understood. The benefits of IVIG are unknown. This study will provide evidence for IVIG prophylaxis recommendations in pediatric leukemia patients.

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### Impact of Demographic & Racial Differences on DNA Repair Capacity in Lung Cancer

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OBJECTIVES/GOALS: Lung cancer is the leading cause of cancer-related mortality in the United States for both men and women. African Americans are disproportionately affected with lung cancer, having higher incidence and mortality rates compared to Caucasian men and women. African American smokers are diagnosed with lung cancer at a lower age with lower cumulative smoking history. Differences in socioeconomic and environmental factors likely contribute to lung cancer disparities, but less is known about acquired biologic alterations that can promote initiation and progression of lung cancer, particularly in African Americans. This is of interest because there may be other biological, genetic, or environmental factors contributing to lung cancer outcomes as it relates to differences in gender and race. One potential biologic variable may be in the DNA repair capacity (DRC), which describes a cell's ability to repair damage to DNA caused by carcinogens, oxidants, and radiation. Altered DNA repair is a hallmark of cancer, leading to mutations and malignant transformation. We hypothesize that DRC is decreased in African Americans with lung cancer compared to Caucasian Americans with lung cancer, contributing to the disparity that exists in this racial group. We will 1) perform a retrospective chart review to determine demographic differences between African Americans and Caucasians at three central Indiana hospitals and 2) determine the impact of race and lung cancer on DRC amongst African Americans and Caucasians with and without lung cancer. METHODS/STUDY POPULATION: Lung cancer patients are identified in 3 central Indiana hospitals with different payer source and patient populations using ICD codes. Collected demographics include age, gender, pack-years, lung cancer histology, treatment, and mortality. DRC is measured by host-cell reactivation (non-homologous end-joining and nucleotide excision repair pathways) by flow-cytometry. Measurement of DRC is performed on PBMCs obtained from 120 patients (male and female, African Americans and Caucasians with and without lung cancer). Correlation of DRC and lung cancer will be determined by comparing lung cancer diagnosis to quartile DRC, and adjusted for confounders (measured demographics). Correlative measures will include measures of DNA damage and genomic instability. RESULTS/ANTICIPATED RESULTS: 3450 lung cancer patients were diagnosed with lung cancer at Indiana University Hospital between 1/1/2000 – 5/31/2015. Of these, 48.2% were female and 92.7% smokers. African Americans, Caucasians and Other ethnicities represented 12%, 86% and 2%, respectively. Of smokers, 11.4% were African American. The primary payer source was Federal/Medicare. Retrospective review of lung cancer patients from two additional health systems (county and VA hospitals) will be

performed as above with outcomes measured. DRC and additional correlative measures will be performed as in Methods. DISCUSSION/SIGNIFICANCE OF IMPACT: If present, altered DRC in African Americans compared to Caucasians may contribute to the disproportional impact of lung cancer on African Americans. If DRC is decreased in African Americans with lung cancer, future studies will focus on identifying potential genetic, epigenetic and environmental causes for this decrease.

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### Impact of Patients' Health Literacy Level on Patients' Health Outcomes

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OBJECTIVES/GOALS: The objective of this study is to examine the relationship between gastro-intestinal (GI) patients' health literacy levels and patients' health outcomes (length of stay, readmission, complication). METHODS/STUDY POPULATION: A research team at the University of Alabama at Birmingham (UAB) 's Gastro-Intestinal (GI) surgical department collected inpatient GI patients' health literacy data by distributing the Brief Health Literacy Screen (BRIEF) survey to patients are about to be discharged. Patients' health outcomes data were gathered through Business Objects, an online platform that allows physicians and researchers to access and gather patients' medical information with an IRB approval. After accounting for necessary control variables, logistic regression and multiple linear regression models will be run to assess whether there is a significant relationship between patients' health literacy levels and patients' health outcomes. RESULTS/ANTICIPATED RESULTS: Three specific hypotheses are proposed in this study. H1: GI patients' health literacy levels will be negatively associated with their lengths of stay H2: GI patients' health literacy levels will be negatively associated with their readmission status to the hospital H3: GI patients' health literacy levels will be negatively associated with their complication status to the hospital DISCUSSION/SIGNIFICANCE OF IMPACT: This study allows us to further our understanding of patients' health literacy level and its' relationship with important health outcomes. By looking at a variety of diverse health outcomes, the impact of a patients' health literacy level on that patients' health outcomes will be observed more clearly.

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### Improving Data Capacity and Predictive Capability of NSQIP-P Using Designed Sampling from Databases

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OBJECTIVES/GOALS: Designed sampling from databases (DSD) methods have been used to cross-check electronic medical records for errors, structure study design, and, we hypothesize, can be used to make data collection for surgical quality metrics more efficient, particularly within national databases. We plan to apply statistical and DSD methods to accomplish the following aims:

1. Identify the most important elements in managing post-operative pain
2. Identify the most informative procedure or population-based targets to focus collection of additional, labor-intensive detail surrounding adequacy of pain control (i.e., Patient Reported Outcome Measures (PROMs)).

**METHODS/STUDY POPULATION:** Our study population includes all children, ages 1-18 years, captured in the National Surgical Quality Improvement Project-Pediatric (NSQIP-P) from 2019 to 2021. We plan to apply statistical (regression modeling) and DSD methods to accomplish the aims listed above. **RESULTS/ANTICIPATED RESULTS:** For Aim 1, we expect to identify patient, procedure, and perioperative pain management practices that influence postoperative pain. For Aim 2, we will focus on outcomes such as PROMs that are challenging to obtain. By applying DSD methods, we will identify specific procedure and/or population-based cohorts to capture PROMs and decrease data collection burdens, while maintaining power, as the project is scaled nationally to all of NSQIP-P. **DISCUSSION/SIGNIFICANCE OF IMPACT:** Data from this study will inform expansion of NSQIP-P to collect novel outcomes of clinical and societal importance without prohibitively increasing data collection burden.

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### In Teenagers Who Smoke Cigarettes Are Nicotine Patches as Compared to Placebo Effective to Decrease the Number of Cigarettes Smoked? – A Systematic Review

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**OBJECTIVES/GOALS:** The aim was to examine whether nicotine patch was more effective in encouraging abstinence from cigarettes smoking compared to placebo. **METHODS/STUDY POPULATION:** Randomized controlled trials involving the general teenage age group smokers who were current smokers-“smoked less than 100 cigarettes over their lifetime and smoked at the time of the interview. Databases were searched for relevant studies reported in English that employed a randomized design published since 2000. Two authors extracted data and assessed quality. The primary outcomes and prioritization were continuous abstinence at 3, 6 and 12-month follow-up or more for the number of patients who responded to treatment, defined as a reduction/abstinence. Heterogeneity between studies did not preclude combined analyses of the data. **RESULTS/ANTICIPATED RESULTS:** 4 of 266 publications were included. Four studies reported positive effects on smoking cessation at end of treatment: (1) nicotine patches improved continuous abstinence at 6 weeks – 9 weeks months; (2) nicotine patch improved continuous abstinence at 3 to 6 months; (3) nicotine patches improved continuous abstinence 6 and 12 months; (4) nicotine patches improved continuous abstinence at 6 months – 12 and 24 months (5). All studies showed, continuous abstinence at follow up differed in percentage between groups both at 6 weeks through 24 months, with NRT (Nicotine patch) intervention groups achieving higher rates in most of the studies compared to placebo intervention group. **Conclusions:** NRT intervention methods seem to increase smoking abstinence in those treated for smoking cessation. Further and larger sample size studies are required to make stronger the base of evidence. **DISCUSSION/SIGNIFICANCE OF IMPACT:** Four

randomized controlled trials investigating the effectiveness of smoking cessation interventions, for teenagers who smoke cigarettes were identified for inclusion in this review. Four of the studies reported significant effects on smoking cessation, providing evidence of effectiveness of NRT (nicotine patch), behavioral support and combinations of the two, although not all trials intervention treatments found an effect. The four studies reported important intervention effects at both the short and long follow-ups required: 6 weeks up to the 24 months, thereby, providing stronger evidence to support the effectiveness of NRT intervention on smoking cessation. All studies showed some evidence of improved smoking abstinence outcomes. The four studies had in common that the smoking cessation interventions provided a combination of intent to treat prevention, and of all the clinical trials none of them suggested a negative effect of smoking cessation treatment on substance use outcomes using NRT. However, the studies used reliable methods and reported their cases properly, but the small number of studies reviewed for the systematic review makes the conclusion about the effectiveness of these interventions uncertain. The papers visibly stated how the trials protected against bias, as indicated by the Yes (low risk). No (high risk) and U as “unclear risk.” All four studies conducted a random sequence generation of participants enrolled into the study sample.

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### Learning from Patient Experience to Improve Diagnosis: a Pilot Study

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**OBJECTIVES/GOALS:** Leveraging Patient’s Experience to improve Diagnosis (LEAPED) is our proposed method of measuring diagnostic error through seeking patient feedback on their understanding of their diagnosis and health status following emergency department discharge. To pilot test LEAPED’s feasibility, we deployed and determined patient uptake of LEAPED. **METHODS/STUDY POPULATION:** To test LEAPED, we employed a longitudinal cohort study design at emergency departments across one academic health system in the Mid-Atlantic region. Patients consented to complete questionnaires regarding their understanding of their diagnosis and/or follow-up steps and their health status at 2 weeks, 1 month, and 3 months following emergency department discharge. People aged 18 and older who were seen at the emergency department within the past 7 days with at least one chronic condition (hypertension, diabetes, history of stroke, arthritis, cancer, heart disease, osteoporosis, depression, and/or chronic obstructive lung disease) and one or more of the following common chief complaints: chest pain, upper back pain, abdominal pain, shortness of breath/cough, dizziness, and headache were eligible to join the study. **RESULTS/ANTICIPATED RESULTS:** Of those enrolled (n = 59), 95% (n = 53) responded to the two week post-ED discharge questionnaire (1 and 3-month ongoing). Of the 6 non-responders, 1 had died and 3 were hospitalized at two weeks. The average age was 50 years (SD 16) and 64% were female. Over half of participants (53%) were white and 41% were black. Almost one-third (27%) reported they were not given an explanation of their health problem on leaving the ED, and of those, a third did not have an understanding of what steps to take after leaving the ED. Participants reported a new health problem was identified after ED discharge (19%), worsening health status (12%), and health status stayed the same (16%). **DISCUSSION/**