utilize the Internet as a health resource. Providers can refer patients to educational materials produced by major medical associations available on their websites. However, patient educational materials (PEMs) published by professional organizations from other surgical specialties have been shown to be difficult to read for the average American. The NIH and AMA recommend that PEMs be written between a sixth and eighth grade reading level. In this study, we assess the readability of online PEMs on gynecologic cancer published by major medical associations. METHODS/STUDY POPULATION: Seven national medical association websites with PEMs on gynecologic malignancy were surveyed: American College of Obstetricians and Gynecologists, Center for Disease Control, Foundation for Women's Cancer, National Cancer Institute, National Cervical Cancer Coalition, National Ovarian Cancer Coalition, and Society of Gynecologic Oncology. Online PEMs were identified and analyzed using five validated readability indices. One-way ANOVA and Tukey's test were performed to detect differences in readability between publishers. RESULTS/ANTICIPATED RESULTS: Two hundred and thirty PEMs were included in this analysis. Mean readability grade levels with standard deviation were: 11.3 (2.8) for Coleman-Liau index; 11.8 (3.2) for Flesch-Kincaid; 11.1 (1.2) for FORCAST formula; 12.5 (2.7) for Gunning FOG formula; 12.1 (2.6) for New Dale-Chall formula; and 13.5 (2.5) for SMOG formula. Overall, PEMs were written at a mean 12th grade reading level. Only 4.3% of articles were written at an 8th grade reading level or below. ANOVA demonstrated a significant difference in readability between publishing associations (p<0.01). PEMs from the Center for Disease Control had a mean 10th grade reading level and were significantly lower than all other organizations. PEMs from The Foundation for Women's Cancer had a mean 13th grade reading level and were significantly higher than most other organizations. DISCUSSION/SIGNIFICANCE OF IMPACT: Gynecologic oncology PEMs available from major medical association are written well above the recommended sixth to eight grade reading level. Simplifying PEMs may improve patient understanding of their disease and facilitate physician-patient communication.

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Reducing Reintubation Risk in High-Risk Cardiac Surgery Patients with High Flow Nasal Cannula

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OBJECTIVES/SPECIFIC AIMS: More than half a million adult patients nationally undergo cardiac surgery each year. Reintubation following cardiac surgery is common and associated with higher short- and long-term mortality, increased cost, and longer lengths of stay. The reintubation incidence is estimated at 5-10%. Patients undergoing cardiac surgery are increasing in age and comorbidity burden, and receive increasingly complex cardiac surgical procedures, complicating decision making around when to extubate postoperative patients. Compounding this complexity are financial pressures to maintain high throughput and maximize ICU bed availability. Providers are often compelled to extubate high-risk patients earlier, despite the potential for an increased risk of reintubation. Understanding the risk factors for reintubation after cardiac surgery and identifying effective interventions to reduce these reintubations is of critical importance to optimize patient outcomes. High-flow nasal cannula (HFNC) provides up to 60 liters per minute of 100% oxygen, dead space washout, and humidification to improve secretion clearance, and has shown some benefits in improving hypoxia and reducing reintubation in select populations. However, its benefit in high-risk patients undergoing cardiac surgical procedures is not known and therefore clinicians may still be reluctant to extubate these patients early and introduce HFNC, despite the known risks of prolonged intubation. To address this important issue, we aim to develop and validate a model to predict postoperative reintubation after cardiac surgery using data readily available from the electronic health record (EHR) and use this data to complete a pilot randomized controlled trial (RCT) of postextubation HFNC to prevent reintubation in cardiac surgery patients identified as at high risk for reintubation. METHODS/STUDY POPULATION: Based on retrospective data demonstrating a 4.7% reintubation incidence within 48 hours in our CVICU, we estimate that there will be 340 reintubations available for analysis of the risk factors for reintubation to develop our predictive model from November 2, 2017 (our EHR go-live). We require 15 events per predictive variable to avoid overfitting the model, giving us at least 22 variables for analysis and inclusion in the model. Model validation and calibration will be performed using a bootstrapped validation cohort. Next, we will prospectively study 120 patients with a greater than 10% predicted risk of reintubation (double the baseline risk of the overall population) and randomly assign them to either HFNC or usual care, to test the hypothesis that HFNC decreases the rate of reintubation in high-risk patients. RESULTS/ANTICIPATED RESULTS: In addition to developing a predictive model, refining it, and validating its ability to predict the primary outcome of reintubation within 48 hours, I will further assess whether HFNC reduces total duration of mechanical ventilation, hospital length of stay, and ICU length of stay in this high-risk population. I will use these data to establish the feasibility of EHR-integrated predictive modeling and randomization, as well as to guide a future multicenter clinical trial that will pragmatically leverage the EHR for patient selection, enrollment, randomization, and data collection. DISCUSSION/SIGNIFICANCE OF IMPACT: Assuming HFNC decreases reintubation rates by 50%, at a 1:1 ratio of cases to controls, we will require 435 patients in each group (970 total), to have an 80% power and alpha of 0.05 to detect a difference. As this will require a multicenter study, we will instead focus on using data from this pilot study to: 1) refine our sample size estimates. 2) demonstrate the feasibility of our novel EHR-integrated pragmatic trial design. 3) identify and screen collaborators at other institutions, including obtaining important regulatory and legal approval. 4) establish a data safety monitoring board for the trial. 5) refine the data collection infrastructure, leveraging commercially available resources in one of the largest enterprise EHR systems (Epic) and associated resource-sharing products, such as Epic's App Orchard.

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Systematically Integrating Microbiomes and Exposomes for Translational Research

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OBJECTIVES/SPECIFIC AIMS: Characterize microbiome metadata describing specimens collected, genomic pipelines and microbiome results, and incorporate them into a data integration platform for enabling harmonization, integration and assimilation of microbial genomics with exposures as spatiotemporal events. METHODS/STUDY POPULATION: We followed similar methods utilized in