

ORAL RESEARCH PRESENTERS - 2017

1. **Dr. Christopher Steele**
Johns Hopkins/Broadway

Multi-Center Comparison of Low-Value-Care Perceived by Medical Students During Their Internal Medicine Clerkship
2. **Dr. Francoise Marvel**
Johns Hopkins/Bayview

30 Day Readmission Reduction and Application Usage Among Acute Myocardial Infarction Patients: Preliminary Findings from the Myocardial Infarction Combined-Device Recovery Enhancement (MICORE) Study
3. **Dr. Himanshu Rawal**
MedStar Health Internal Medicine/
Union Memorial

Can We Treat Alcohol Withdrawal in a Safer Way?
4. **Dr. Sara Brown**
UMMC/VA

Optimization of Clostridium Difficile Testing in Hospitalized Patients
5. **Dr. Joseph Maciuba**
Walter Reed

Improving Vancomycin Initial Dosing
6. **Dr. Jeffrey Patterson-Fortin**
Johns Hopkins/Broadway

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7. **Dr. Elie Al Kazzi**
MedStar Health Internal Medicine/
Union Memorial

Efficacy and Safety of Endoscopic Mucosal Resection for Large Colorectal Polyps: A Systematic Review and Meta-Analysis
8. **Dr. Sayeedul Hasan**
Sinai Hospital

Early Endoscopy Lowers Mortality in Upper Gastrointestinal Bleeding

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in research process (4 sentences or

less): My role in the research was to help categorize all the responses as outlined in the methods section, conduct the statistical analysis of the data and writing up the findings. I am also in the process of expanding these findings to submit for publication.

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Title: MULTICENTER COMPARISON OF LOW-VALUE-CARE PERCEIVED BY MEDICAL STUDENTS DURING THEIR INTERNAL MEDICINE CLERKSHIP

Purpose: To compare perceptions of low-value care (LVC) by medical students at four institutions after completion of their medicine clerkship as a means to identify areas to focus for the development of high-value care (HVC) curriculum in medical education.

Methods: This study is a retrospective qualitative and quantitative analysis of medical student narratives from The Johns Hopkins University School of Medicine, Icahn School of Medicine at Mount Sinai, University of Alabama at Birmingham School of Medicine, and Tulane University School of Medicine. Each response was first categorized into three general LVC theme of labs, imaging, or procedures. Based on a review of the literature and student responses, 7 LVC subcategories were specified *a priori* and included 1) Testing for low prevalence disease process; 2) Excessive daily labs; 3) Testing that will not change management; 4) Consultant request; 5) Previous health information not reviewed or received; 6) "Defensive medicine"; and 7) Errors in Clinical Judgement. A confirmatory analysis was done with three reviewers classifying each response independently. Some responses fit multiple categories but no new themes were identified. Reviewers compared results and came to consensus when discrepancies occurred. χ^2 testing were performed to determine significance.

Results: Responses were received from 307 out of 577 (53%) eligible students, with 164 (53%) providing an example of LVC at their institution. The most common examples of LVC were laboratory tests (n=115 [70%]), imaging (n=60 [37%]) and procedures (n=8 [5%]). All institutions identified the same top four subcategories for LVC which were testing for low prevalence disease processes (44%), excessive daily labs (44%), errors in clinical judgement (26%) and testing that would not change management (21%). Within those categories, it was found that institution 2 identified fewer instances of ordering excessive labs (28% vs 46 - 54%; p=0.047) compared to the other institutions.

Conclusion: This is the first multi-institutional study to demonstrate similarities in perceptions of LVC by students. Despite differences in geographic location and funding (private vs public), the top four categories remained consistent. These findings can provide framework for educational objectives that address these issues in a HVC curriculum. Response variation as seen with institution 2 offers opportunities for schools through surveys such as the Graduate Questioner to assess their performance amongst their peers nationally and to personalize their HVC curriculum to address the most pressing needs at that institution.

Program Director's Name:

Sanjay Desai, MD

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I serve as clinical co-investigator, project lead for Myocardial Infarction COmbined-device Recovery Enhancement (MiCORE) Study. I have spearheaded the development of this digital health project since my intern year in 2014. I have presented at the National American of College of Physicians Conference in 2016 Washington D.C. as a Finalist in Dragon ACP Dragon's Lair Competition: Breathing Fire into Health Care Transformation.

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30-DAY READMISSION REDUCTION AND APPLICATION USAGE AMONG ACUTE MYOCARDIAL INFARCTION PATIENTS: PRELIMINARY FINDINGS FROM THE MYOCARDIAL INFARCTION COMBINED-DEVICE RECOVERY ENHANCEMENT (MiCORE) STUDY.

Francoise A. Marvel, MD, Erin Spaulding, RN, BSN, PhD ('18); William Yang, MD; Matthias Lee, PhD, Bao Chau Lu, MS; Jacob Sama, MD, Farhan Merali, MD MBA; Seth S. Martin, MD MHS

Purpose: To determine if providing a prevention-focused Cardiology software application ("app") and smartwatch to post-Acute Myocardial Infarction patients during inpatient admission and 30-days post-discharge reduced 30-day readmissions compared to regional readmission rates of 20%.

Methods: This is an observational study of acute myocardial infarction patients at the Johns Hopkins Bayview and Johns Hopkins Hospital Cardiac Units. Early in admission, acute myocardial infarction patients are provided with an app and smartwatch which provides functionality allowing patients to develop medication self-management skills, coordinate follow-up appointments, learn about critical preventative cardiology topics via videos, facilitate pharmacy interaction to access medication, and connect with health resources across the continuum of care. Chart review of electronic medical records at Johns Hopkins Hospital and Johns Hopkins Bayview, and review of CRISP regional data were conducted to determine if patients were readmitted at 30-days.

Results: There was a significant difference between the baseline acute myocardial infarction 30-day readmission in the United States which is on average at least 20% and the Corrie-enrolled readmission rate which was 0% (N=25). Additionally, patients' data usage shows robust use during the 30-day period with an average of 24 logins, some signing on as often as 6 times per day and some every day for over 60 days. A significant amount of users are exploring features of the application with 30% of users visiting 4 or more screens per session. An initial cost-savings model demonstrates a savings of \$44,000 per 10 acute myocardial infarction patients in which the standard 20% (2 patients) are not readmitted at 30-days (based on Center for Medicare and Medicaid reimbursement and penalty costs).

Conclusion: Digital health technologies have the potential to transform health care by providing cost-effective patient-centered tools that are accessible to the majority of patients, can be developed for responsiveness to a patient's healthcare needs, and provide real-time information.

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Resident was heavily involved in all aspects of this research including study design and implementation and data collection.

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Can We Treat Alcohol Withdrawal In A Safer Way?

Background and Objective:

Alcohol withdrawal syndrome occurs in patients who have become chronically alcohol dependent and then undergo abrupt cessation. Benzodiazepines have long been the treatment of choice for the management of alcohol withdrawal; however, benzodiazepines can be associated with serious side effects. Recent studies have suggested that anticonvulsants can be used as adjunctive therapy to traditional benzodiazepines. The objective of this study is to evaluate the efficacy of anticonvulsants in reducing the severity and duration of alcohol withdrawal, compared to benzodiazepines alone..

Methods:

We developed a new alcohol withdrawal protocol with anticonvulsants including gabapentin, divalproex sodium, or valproic acid. Patients admitted to the intermediate care unit (IMCU) at our community teaching hospital with the presumed diagnosis of alcohol dependence and at risk of withdrawal were enrolled in the study. Between June 2016 and March 2017, all patients admitted to the IMCU were randomized to either the standard benzodiazepine-based protocol (control group) or the anticonvulsant-based protocol (intervention group). Patients were assessed daily for any signs of delirium using the Confusion Assessment Method (CAM). Data was extracted from the electronic medical record and included the Clinical Institute Withdrawal Assessment for Alcohol (CIWA) score as well as benzodiazepine requirements (calculated in lorazepam equivalent dose).

Results:

There were 45 patients in the control group and 28 patients in the intervention group. There were no significant differences in demographics such as age and race, amount and type of alcohol consumption, or the history of alcohol withdrawal. The median and interquartile ratio (IQR) of severity of CIWA scores in the control and intervention groups was 3 (0.9, 5) and 0.8 (0.2, 3.3), respectively ($p=0.01$). The median and IQR for benzodiazepine requirements for patients in the control and intervention group during their stay in the emergency department before admission were 0.0 (0,1.7) and 1.00 (0, 2.4) mg, respectively ($p=0.1$). The median and IQR of benzodiazepine requirements after the patients were admitted to IMCU were 7 (2, 20) mg in the control versus 0 (0, 3) mg in the intervention group ($p<0.001$). The median and IQR of commutative benzodiazepine requirements for the total duration of the stay in the hospital were 10 (2, 22) versus 1 (0.0, 9) mg in the control and the intervention group, respectively ($p=0.008$). The median and IQR of the duration of benzodiazepine therapy was significantly lower in intervention group compared to control group, (0 [0, 1] vs 2 [0.5, 5] days, $p<0.001$). The number of patients who developed delirium in the control group was 7 versus no patients in the intervention group ($p=0.04$).

Conclusion:

Adjuvant therapy with anticonvulsants is efficacious in reducing the severity of alcohol withdrawal and benzodiazepine requirements

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OPTIMIZATION OF *CLOSTRIDIUM DIFFICILE* TESTING IN HOSPITALIZED PATIENTS. Brown S, MD, Friedland A, MD, Glick D, MD, Lusby M, Leekha S. The University of Maryland Medical Center and Baltimore VA Medical Center, Baltimore, MD.

Background: Testing for *Clostridium difficile* (*C. difficile*) is common in patients who do not meet clinical criteria. Because testing at most facilities is based on a highly sensitive test, colonized individuals will be readily detected even in the absence of true infection. This creates potential harm to the patients. The aim of this project was to improve *C. difficile* testing in hospitalized patients by first collecting data on ordering practices, then designing and introducing an intervention targeting frequently misused indications, and finally re-analyzing data after the intervention.

Methods: We collected baseline data for inpatients undergoing *C. difficile* testing from 2/19/16 to 3/19/16 at University of Maryland Medical Center. This included information on presence of clinically significant diarrhea, alternate causes of diarrhea (e.g., laxatives), whether testing was done as part of a sepsis panel, and prior testing during the same admission. In December 2016, an alert was created and placed into the Electronic Medical Record (EMR) notifying providers at the time they ordered the test to confirm appropriateness and allow the opportunity to delete the order. Post-intervention data collection was performed 1/21/17 to 2/19/17 to assess the impact of the intervention.

Results: The pre-intervention group included 280 patients of which 35 (13%) were positive. The post-intervention group included 167 patients, of which 18 (11%) were positive. Comparing post- to pre-intervention, we found an increase in proportion of patients with acute diarrhea (70% vs. 60%, $p < 0.05$), and an increase in those with a documented indication for testing (81% vs. 67%, $p = 0.001$). We observed a decrease in *C. difficile* tests ordered in the presence of laxative use (38% vs. 46%, $p = 0.08$) but no significant change in the frequency of repeat testing during the same admission (26% vs. 31%, $p = 0.31$). Overall, testing was considered clinically indicated in 54% post-intervention compared to 40% pre-intervention ($p = 0.004$); however, this difference was not statistically significant among only those with positive tests.

Discussion: An EMR based intervention consisting of alerts on appropriateness of *C. difficile* testing led to significant decreases in inappropriate testing. However, a large proportion of testing continued to occur in the absence of appropriate indication. Additional opportunities via education or automatic cancellation (as opposed to alerts) in the EMR may need be necessary for further improvement in appropriate testing for *C. difficile* and to reduce cost and potential harm.

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Shimeall, MD MPH FACP

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IMPROVING VANCOMYCIN INITIAL DOSING

Joseph Maciuba, MD, Member ACP; Andrew Miller, MD, Member ACP; Sarah Ordway, MD, Member ACP; A.J. Greco, MD, Member ACP; Kyle Keinath, DO, Member ACP; Natalie Mitchell, MD, Member ACP; Adam Barelski, MD, Member ACP

Walter Reed National Military Medical Center, Bethesda, MD

Purpose of Study: This retrospective study reviewed the vancomycin prescribing practices of internal medicine physicians on a single hospital ward.

Methods: We performed a retrospective audit of vancomycin orders prescribed from November 2015 to October 2016 (n = 205) from a single hospital ward. Data were collected using electronic patient records and included age, gender, height, weight, serum creatinine, diagnosis, initial dose of vancomycin, and length of stay. Exclusion criteria included vancomycin orders written by a non-internal medicine service, repeat vancomycin orders written after an initial order, or if data needed to calculate creatinine clearance (weight, serum creatinine) had not been documented. Actual body weight and creatinine clearance were used to determine the appropriate initial dose for each patient. These values were compared to the actual doses administered.

Results: Of 205 total initial vancomycin doses on a single hospital ward, there were 174 doses that were included in the analysis. Of these 174 doses, only 58 (33.33%) doses were appropriately dosed when adjusted for actual body weight and creatinine clearance.

Discussion: Over the course of a year, only one third of all initial vancomycin doses were appropriate given a patient's actual body weight and renal function. In an effort to improve target serum concentrations of vancomycin, we plan to implement an electronic order set for vancomycin initial dosing. After implementation, patient records will be analyzed to assess the impact of this intervention on appropriate vancomycin dosing. Future directions may be directed toward improving the timing of drawn vancomycin levels, improving nursing documentation of medication administration, and assessing initial dose-trough correlation.

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in research process (4 sentences or

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MYELOPROLIFERATIVE NEOPLASMS ESCAPE LNK INHIBITION BY DOWNREGULATING DEUBIQUITINATION

Jeffrey Patterson-Fortin MD¹, Donna M. Williams PhD¹, Ophelia Rogers¹, Jerry L. Spivak, MD¹, and Alison R. Moliterno MD¹.

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Purpose: Delineate how mutations in myeloproliferative neoplasms that activate JAK2 bypass negative regulation by the adapter protein, LNK.

Methods: An myeloproliferative neoplasm mouse model driven by the JAK2 V617F mutation and a human in vitro model were employed. RT-qPCR was employed to assess gene expression. Protein expression was assessed by Western blot analysis.

Results: Using both a human in vitro model and a murine in vivo model of MPN, we show that JAK2 V617F avoids Lnk inhibition by decreasing expression of MERIT40, a core subunit of the debubiquitinating complex, critical for protein stability and DUB activity, leading to increased ubiquitination of JAK2 and subsequent activation of JAK2.

Conclusions:

- First demonstration both in vivo and in vitro that JAK2 V617F avoids Lnk inhibition by decreasing expression of MERIT40
- Loss of MERIT40 with resulting loss debubiquitinating activity leads to increased ubiquitination of JAK2
- Ubiquitinated JAK2 is more active resulting in increased JAK2 signaling
- Deubiquitinating agents could be useful as a novel targeted therapy in the MPN

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**Indicate your participation in research
process (4 sentences or less):** Resident was
heavily involved in all aspects of design,
literature search and data abstraction, and all
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**EFFICACY AND SAFETY OF ENDOSCOPIC MUCOSAL
RESECTION FOR LARGE COLORECTAL POLYPS: A
SYSTEMATIC REVIEW AND META-ANALYSIS**

Purpose of the study:

Endoscopic mucosal resection (EMR) has gained acceptance as an endoscopic option for treatment of large adenomatous colorectal lesions and early malignant polyps. The aims of the study were to evaluate the efficacy and safety of EMR for large colorectal polyps.

Methods:

The methods for analysis as well as inclusion criteria were created based on the Preferred Reporting Items for Systematic Reviews and MetaAnalyses (PRISMA) recommendations. A literature search for relevant articles was performed in November 2016 using Pubmed, Embase, and the Cochrane Central Register of Controlled Trials. We included all clinical studies published in which patients underwent EMR for colorectal lesions 20 mm in screening and diagnostic procedures. Exclusion criteria included animal studies and studies with <10 patients. If there were studies with overlapping cohorts, only the most recent study was included. We evaluated studies that reported on the per-lesion proportion of successfully completed (en-bloc or piecemeal) endoscopic resection and the side-effect profiling of EMR in adults. We performed paired independent reviews to screen abstracts and full-text articles, to assess the risk of bias for each study, and to abstract data. Our primary outcome was the per-lesion proportion of completed endoscopic resection. We also investigated the rate of recurrence and adverse side effects including intraprocedural and delayed bleeding, and perforation.

We used the I² score to identify heterogeneity.

Results:

In total, 841 items were identified, the full text was retrieved for 125 articles and 55 articles met inclusion criteria. We included 11,879 participants, with a median age of 67 years (range: 47 – 84 years), 58.8% were males. There was a 91% (95%CI: 88 - 94%) success rate for lesions resected en bloc, and a 92 % (95%CI: 88 - 96%) success rate for lesions resected piecemeal. Recurrent adenoma was noted in 14% (95% CI: 12 - 6%) at the first follow up visit (median= 6months [range: 1- 95]). The rate of intraprocedural bleeding was 9% (95% CI: 7 - 12%) and delayed bleeding was 3% (95% CI: 2 - 4%). Surgical intervention was not required for intraprocedural bleeding but was required for one patient with delayed bleeding. Rate of perforation was 1% (95% CI: 1 - 2%). Among the patients who suffered from a perforation, 26% needed surgical intervention (95% CI: 12 - 39%). No mortality was observed in any of the analyzed patients.

Conclusions:

EMR is considered an efficacious procedure for removal of large colorectal polyps. The procedure provides a wide safety margin with respect to perforation and bleeding and without any reported mortality.

Program Director's Name: Stephanie Detterline, MD FACP

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Indicate your participation
in research process (4 sentences or
less):

Involved in conception and design, and acquisition
of data, and interpretation of data

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**EARLY ENDOSCOPY LOWERS MORTALITY IN UPPER
GASTROINTESTINAL BLEEDING**

Sayeedul Hasan MBBS¹, Amitasha Sinha MBBS¹, Michelle Le DO¹,
Rakesh Vinayek MD¹, Sudhir Dutta MD¹

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Background: Recent studies have reported Gastrointestinal (GI) bleeding as the most common cause of hospitalization in United States. Upper GI bleeding remains a leading cause of morbidity and mortality. Although endoscopy is the mainstay of management in upper GI bleeding, timing of endoscopy in improving outcomes has been controversial.

Objective: The aim of our study is to evaluate "time to EsophagoGastroDuodenoscopy (EGD) from admission" as a predictor of outcomes in upper GI bleeding.

Methods: We used the National Inpatient Sample (NIS) database for year 2010, and identified all patients with the ICD9 discharge diagnosis of Upper GI bleeding, and procedure code for EGD and blood transfusion to create our dataset. We evaluated time to EGD, age, gender, race, presence of chronic diseases, transfer from outside hospital, day of admission, and time to blood transfusion, as predictors for mortality. We also evaluated length of stay, and charges of hospitalization as outcomes. Early EGD was defined as EGD within 24 hours of admission. Univariable and multivariable analysis was performed using Pearson's chi2 analysis and logistic regression, respectively.

Results: A total of 28,255 discharges were identified who underwent both EGD and blood transfusion, which had a mean age of 68 years (15.85, 25-94), with 51.7% males, and 70.7% white. There were 472 deaths (1.7%), and the mean length of stay and mean hospital charges were 4 days and \$40,233 respectively. Early EGD was significantly associated with decreased mortality on univariable analysis ($p < 0.001$). On multivariable analysis, early endoscopy continued to be an independent predictor of decreased mortality after adjusting for older age, presence of chronic diseases, transfer from outside hospital, and time to blood transfusion ($p < 0.001$). Early EGD was also associated with an increased length of stay and hospitalization charges.

Conclusion: Our study suggests that early EGD is strongly associated with improved mortality in upper GI bleeding.