Abstract Title: Implementation of a COPD Management Plan to Improve Compliance with Evidence-based Guidelines

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Introduction: COPD is a significant cause of morbidity and mortality in the United States and is estimated to become the third leading cause of death worldwide by 2020. Implementation of certain interventions in COPD care has been shown to reduce exacerbation however adherence to these practices is often suboptimal. We implemented a “McLaren COPD Management Plan” (MCMP), which was adapted from “My COPD Action Plan” from the American lung Association, at an internal medicine residency group practice (IMRGP) to increase compliance with COPD guidelines.
Methods: The aim of this quality initiative was to improve compliance with evidence-based guidelines of COPD by 30% through implementation of the MCMP over a twelve-week period. Pre-intervention data was collected by chart review of twenty randomly selected patients with COPD to assess compliance with guidelines. The intervention consisted of resident education and administration of the MCMP. Post-intervention data was collected through review of randomly selected patient charts. The pre- and post-intervention data was then compared.
Results: In comparison to the pre-intervention group, the post-intervention group demonstrated ≥ 30% increased compliance with GOLD staging, discussion of inhaler technique, smoking cessation, advanced directive, and pulmonary rehabilitation.
Discussion: Reasons for noncompliance includes management complexity, limited time, and knowledge gaps. Management plans can improve compliance and reduce COPD exacerbations. By implementing the MCMP at IMRGP, we achieved improved compliance above the set goal in many recommended interventions.
Conclusion: This quality initiative demonstrates that the use of a form-based COPD management plan can improve compliance with evidence-based guidelines for COPD.

ASSOCIATING MEAN ARTERIAL PRESSURE AFTER IN-HOSPITAL CARDIAC ARREST WITH NEUROLOGICAL AND OVERALL OUTCOMES

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Introduction: Following cardiac arrest and resuscitation, hemodynamic status is critically unstable and may lead to the hypoperfusion of vital organs and poor clinical outcome. In post-cardiac arrest survivors, improved outcomes have been noted with a higher mean arterial pressure (MAP) compared with a lower MAP. However, the ideal MAP after the return of spontaneous circulation (ROSC) is rarely explicitly defined in post-resuscitation care observational studies. With studies portraying the benefits of a MAP >65mmHg, none have shown quality evidence to suggest whether a MAP even higher, for example, >80mmHg, show even better outcomes. The purpose of this study is to evaluate the MAP in cardiac arrest patients achieving ROSC, and observing the difference in length of intubation, ICU length of stay (LOS), and rates of anoxic brain injury.

Methods & Design: A retrospective single-center cohort study was used to design the project. Charts of patients suffering a cardiac arrest in our hospital between January 01, 2018, to February 28, 2019, were reviewed. Patients who met the inclusion criteria suffered a cardiac arrest while admitted in the hospital, achieved ROSC, and survived for at least 48 hours post-ROSC. Patients whose code status was changed to Do Not Resuscitate (DNR) within 48 hours of achieving ROSC were excluded. The remaining patients were divided into two groups. One study group consisted of an average MAP of 60 to 80mmHg at 48 hours post-ROSC, and the other group with an average MAP >80mmHg at 48 hours post-ROSC. The primary outcome analyzed was the presence of anoxic brain injury noted on EEG, as well as the length of intubation, ICU LOS, and mortality rate.

Results: Of the total of 129 patients, 18 patients met our inclusion criteria. Of these 10 patients belonged to the MAP of 60 to 80mmHg group and 8 patients to the MAP >80mmHg group. As compared to 40% mortality in the lower MAP group, there was 12.5% mortality in higher MAP group ($p > 0.05$). The percentage of anoxic brain injury was 20% vs 12.5% in lower vs higher MAP group $p > 0.05$). The mean length of intubation was also decreased in the higher MAP group vs lower MAP group. (3.5 vs 4.9, $p > 0.05$). There was no difference in the ICU LOS amongst the two groups. Our results showed a clinically significant difference amongst the two groups but could not reach statistical significance due to small sample size.

Discussion: The optimal MAP for post-cardiac arrest patients has not been defined by prospective clinical trials. The simultaneous need to perfuse the post-ischemic brain adequately without putting unnecessary strain on the post-ischemic heart is unique to the post-cardiac arrest syndrome. The findings of this study are that cardiac arrest patients achieving ROSC with MAP >65mmHg had a statistically insignificant tendency toward better neurological outcomes, decreased length of intubation and improved mortality after achieving ROSC. The small sample size is a limitation for this study, however, this preliminary study has shown promising results and it is predicted that a bigger population study with similar parameters will extrapolate the same results.

A pilot study of radiochromic film for the QA of prone breast irradiation

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Purpose/Objectives

Prone breast radiotherapy is commonly used to treat patients with pendulous breasts in an effort to reduce dose to the lung and heart. For patients with very large breasts, the breast may rest on the treatment couch. These patients may be susceptible to increased risk of radiation dermatitis due to potential electron scatter from the treatment couch. In this study, we measure radiation dose at the breast/couch interface *in vivo* utilizing an in-house validated radiochromic film dosimeter.

Materials/Methods

For 6 consecutive patients, the breast surface in contact with the couch was traced onto a transparency paper during CT simulation. This contour was then copied onto a piece of Gafchromic EBT3 radiochromic film (International Specialty Products, Wayne, NJ), with a permanent marker. Patients were set up with radiochromic film between the breast and the couch on day 2 of treatment (to exclude any dose associated with day 1 imaging), and surface doses were measured.

Results

For the 6 patients evaluated, median BMI was 39.7 kg/m^2 and median breast clinical target volume was 2433 cc. High dose regions $\geq$ 110% of prescribed dose were found in 5 of 6 patients at the breast/couch interface and as high as 126%.

Patient	BMI (kg/m^2)	Breast CTV (cc)	Maximum % of Prescribed Dose
1	33.8	1629	104.8
2	48.2	3484	110.0
3	37.9	3350	110.8
4	41.5	2526	113.1
5	37.1	2339	118.7
6	41.9	1557	125.8

Conclusions

In vivo dosimetric measurement with radiochromic film is an acceptable and unique method for analyzing hotspots at the breast/couch interface for large breasted prone patients. This form of measurement is uniquely qualified for this indication as it provides a spacial resolution not afforded by other methods and ensures that the maximum hotspot is reported. Based on the data from these measurements, field-in-field technique has been employed to normalize the dose at the breast/couch interface to avoid unnecessary radiation dermatitis for these patients.

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Spica casting alters occupant response in frontal and side impact motor vehicle collisions

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Purpose: Spica casts are often used in the treatment of hip dysplasia and for young children with femur fractures. The majority of parents report transportation is the biggest obstacle they encounter when caring for their spica casted child. While restraint devices for casted children are available, all federally mandated testing has been done using non-casted anthropomorphic test devices (ATDs), also known as crash test dummies. No current commercially available or specially designed restraint device has ever been tested using casted ATDs. The only approved and specially designed safety seat with published data using casted dummies was discontinued in 2015. In light of the significant lack of data available to guide transport of these patients, this study evaluated a series of car seats in a simulated frontal and side impact crash conditions using a casted pediatric dummy.

Methods: A crash dummy representing a 3-year old child was casted with the hips at 60° of flexion and 30° of abduction in a double-leg fiberglass spica cast. Five restraint devices were identified that could accommodate the casted dummy and evaluated via dynamic crash tests simulating a 30 mph frontal crash per federal crash-testing guidelines. Sensors within the dummy recorded data from the head, neck, chest, and pelvis to assess for the likelihood of injury. Four of these restraint devices underwent additional side impact tests with intrusion.

Results:
Although the presence of the cast increased many of the injury metrics measured, all seats passed current federal guidelines for the head and chest in frontal tests. However, while not required as a part of current standard testing protocols, cervical spine injury metrics were elevated beyond generally accepted levels in all seats tested, both with and without a cast. No single seat performed best in all metrics tested. When side impact testing was performed, results for the different seats were inconsistent. While one seat (Graco) exhibited the lowest mandated injury criteria (head and chest protection), this seat also had the greatest pelvic loads. In contrast, the seat specifically designed for children with spica casts (Merritt) had one of the lowest pelvic loads, yet the greatest loading of the head and second highest loading of the chest. The head loading was associated with head contact with the intruding door structure. The remaining seats had mixed results across the different sensors.

Conclusion:
While current child seat options for spica casted children provide sufficient protection in frontal collisions, they do not appear to provide adequate protection in side impact crashes with intrusion. Additional refinement of the child seat design is needed to predictably spread the impact load over the body while preventing contact with the intruding vehicle. However, it remains unclear if ambulance transport is a safer alternative, as no current data exists exploring the safety of spica casted children transported by ambulance. Collaboration between caregivers, the orthopaedic surgeon, and a trained child seat technician is vital to determine the best transport option for each individual child.

FRAME-BASED AND MASKED STEREOTACTIC RADIOSURGERY: A PATIENT EXPERIENCE COMPARISON WITH THE GAMMA KNIFE ICON

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Introduction: Patients undergoing stereotactic radiosurgery (SRS) for intracranial pathology have two treatment options: frame-based versus masked. Each has been shown to have similar outcomes but there are limited data of the patient's experience.

Methods: A retrospective analysis of patient's experience of framed-based or masked SRS using the Gamma Knife Icon from June - November 2018 at one institution was completed. Patients that completed a questionnaire after radiosurgery were reviewed. The visual analogue scale (VAS) was also used, rating pain from 0 – 10.

Results: Twenty-eight patients undergoing SRS completed the questionnaire; 61% of the procedures were frame-based and 39% masked. The mean (±SD) age was 61.2±16.1 years old, and 54% were male. Pathologies treated were metastasis (68%), meningiomas (7%), vestibular schwannomas (7%), arteriovenous malformations (7%), neurocytoma (4%), pituitary adenoma (4%) and glioblastoma multiforme (4%). Of the patients treated with a frame-based technique, 59% did not find SRS to be uncomfortable. Comparatively, 82% of patients who received masked treatments did not find SRS to be uncomfortable. Frame-based treatment patients rated their pain of frame placement on a VAS 1-3 (24%), VAS 4-6 (48%), VAS 7-10 (24%, one patient didn't rate their pain and was excluded). Five patients answered that they did not tolerate the procedure as expected; four of these patients were treated using the framed method. Compared to previous surgery or SRS, two patients (7%) found their experience of SRS was not tolerable (both of which were frame-based), while 93% of patients would consider repeat SRS. All patients who received frame-based and masked treatments felt adequately informed about the procedure. The patient experience of discomfort during SRS was higher with benign versus malignant lesions (63% vs. 20%, respectively). Evaluation of pain during frame placement was similar for patients treated for benign versus malignant lesions (median VAS pain: 6±1.5 [95% CI 4.9 – 7.1] and 4±2.7 [95% CI 2.2 – 5.8], respectively).

Conclusions: We found that patient experience undergoing frame-based treatment was less tolerable and caused more discomfort in comparison to the masked technique. Patients experienced more discomfort when being treated for a benign compared to a malignant pathology.

Hybrid Robotic Versus Open Transversus Abdominus Release: An AHSQC Analysis

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Background:

Open transversus abdominus release (oTAR), traditionally necessary for the repair of large ventral hernias, is associated with a substantial hospital length of stay (LOS). Robotic transversus abdominus release (rTAR) offers the benefits of minimally invasive surgery (MIS) with decreased LOS vs oTAR, but this technique may be inadequate for large, complex hernias. In the hybrid robotic transversus abdominis release (hrTAR), the limitations of MIS are overcome by first performing a robotic flap dissection and subsequently opening the hernia sac. This modification allows for large mesh placement, linea alba medialization, secure closure of wide, complex fascial defects, and resection of the hernia sac and skin. Our aim was to compare short-term outcomes between hrTAR and oTAR patient cohorts.

Methods:

Utilizing the Americas Hernia Society Quality Collaborative (AHSQC), a multi-institutional database, patients were identified who underwent a hrTAR or oTAR between 2016 and 2018. Patient demographics, hernia characteristics, operative details, and short-term postoperative outcomes were analyzed. We utilized propensity score matching to compare oTAR to hrTAR patients, specifically controlling for co-variants shown to affect median LOS.

Results:

In total, 285 oTAR and 95 hrTAR patients were included for analysis, yielding a 3:1 propensity-score matched comparison. In total, the operations were performed by 54 surgeons, 52 oTAR surgeons, 10 hrTAR surgeons, and 8 surgeons who contributed to both groups. Patient and hernia characteristics were similar between groups with a median hernia width of 12 cm. Median LOS was significantly decreased for the hrTAR cohort [3 days (IQR 3)] vs the oTAR cohort [5 days (IQR 3), $P < 0.001$]. Surgical site occurrence (SSO) occurred less frequently in the hrTAR group [5% vs 15%, $P = 0.015$], but there was no significant difference in surgical site infections (SSI) or SSO requiring procedure interventional between groups. There were no major differences 30-day rates of readmission, reoperation, or major complications.

Conclusion:

hrTAR offers significantly shorter length of stay compared to an oTAR approach. This technique offers MIS benefits to patients with large, complex ventral hernia which would have historically been treated with an oTAR. We argue the hrTAR should be added to the armamentarium of an experienced hernia surgery.

Pediatric Laparoscopic Gastrostomy with T-Fasteners: A Technique to Decrease Surgical Site Infection

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Introduction:

Laparoscopic gastrostomy (LG) is a popular technique for establishing long-term enteral access in children. During LG, there are several methods available to create a secure gastropexy including the subcuticular (SC) and T-fastener (TF) techniques. The purpose of this study is to compare local wound infections between these two techniques.

Methods:

A retrospective review was performed of all pediatric patients who underwent LG between June 2012 and June 2018. Patients were divided into two cohorts based on use of the SC or TF gastropexy techniques. Patient characteristics, operative details, wound complications, and outcomes were analyzed.

Results:

In total, 119 patients underwent LG, 81 (68%) in the SC group and 38 (32%) in the TF group. Patient demographics and comorbidities were well-matched. Median operative times were similar (39.5 min-SC vs 37 min-TF, P=0.48). At 30 days, SC patients had a significantly increased incidence of surgical site infection (SSI) when compared to the TF group (20% vs 0%, P<.01). All SC patients with an SSI required antibiotics and 19% had a concurrent abscess requiring incision and drainage. Long-term (30-90 days), there continued to be an increased incidence of SSI in the SC group (11% vs 4%, P=0.44, OR=3.2). There were no differences in early tube dislodgement rates (14% vs 17%, P=0.66), and no patients required operative replacement.

Conclusion:

Utilizing T-fasteners during LG creates a secure gastropexy with a decreased incidence of SSI when compared to a subcuticular technique. Pediatric surgeons should consider this technique during LG placement in children.

Improving Cervical Cancer Screening Rates in a Resident Run Clinic- A QI Project

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Purpose: In 2015, for every 100,000 women, 8 new Cervical Cancer cases were reported and 2 died of cancer. This QI project was undertaken to evaluate and improve cervical cancer screening rates at a resident run IM clinic.

Methods: In the last quarter of 2017, physician data reported that screening rates at the clinic were 36%, lower than those of our other clinical practices. A clinical survey was completed to assess understanding of cervical cancer screening. The first intervention was sharing individual provider data with the residents. This was a weak intervention and did not improve rates of screening. Our second intervention was a team-based approach and pre-visit planning: identifying patients and calling them1-2 days ahead and including PAP in the daily huddle.

Results: The original survey showed that out of 124 women, 66 needed screening. Emailing residents revealed that due to lack of continuity, several listed PCPs were not seeing their own patients and had little control over the process. The team-based approach showed that more PAPs were being done per week, and staff feedback revealed that this intervention did not affect the current process or their time. With a goal of 50% by the end of 2018, we were able to achieve 48.9% screening rates.

Conclusions: We implemented a process as above and are currently working on streamlining it to make it more efficient. Making residents aware of the need of screening and involving a team as part of pre-visit planning has improved screening rates.

Screening for Concussions in the Primary Care Setting: Are We Causing a Bigger Headache?

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Introduction: The US Centers for Disease Control and Prevention estimates that approximately 135,000 children five to 18 years of age go to the emergency department for sports-related concussions annually. The term "mild traumatic brain injury" (mTBI) is often used interchangeably with the term "concussion"; yet, the clinical criteria to define mTBI are poorly differentiated and understood. Mild concussions do not always exhibit overt signs and symptoms, thus leading to a delay in medical attention and diagnosis. Delay in diagnosis results in return to play too soon, increasing the risk of further concussions and chronic traumatic encephalopathy (CTE).

Objective: To assess the prevalence of standardized screening and symptom questioning of mTBI at well child visits and sports physicals in two family medicine clinics.

Methods: This was a retrospective chart review of patients ages five to 18 years who were seen for well child and sports physicals at two family medicine clinics associated with a teaching hospital in Detroit, MI. Data were collected on demographics, sports participation, whether screening was done and if education was offered. The data were analyzed using Student's t-test and the chi-squared test.

Results: We reviewed 555 patients, mean age 11.9 ± 4.0 years, 49.7% female, 50.6% white. Three percent of the patients were screened. The table shows the difference in demographic and clinical factors by screening status. Despite a 30% sport involvement, the symptoms of mTBI and education were discussed at 0.9% and 0.7% of visits, respectively.

Characteristic		Screened	Not Screened	p-value
Mean age (yrs.)		11.9 ± 4.0	14.4 ± 2.5	0.001
Gender	Male	4.7%	95.3%	0.06
	Female	1.8%	98.2%	
Provider	Resident	5.4%	94.6%	0.007
	Attending	1.3%	98.7%	
Clinic	FMC	1.1%	98.9%	0.005
	MMC	5.3%	94.7%	
Race	White	4.3%	95.7%	0.28
	Black	2.8%	97.2%	
	Other	1.0%	99.0%	

Conclusions: Currently, there are no standardized guidelines to identify and discuss mTBI in primary care. Such guidelines would allow clinicians, athletes and parents to better understand the disease process and early warning signs.

Are We Really Having This Conversation? Identifying Barriers To Addressing Advanced Directives.

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Introduction: Advance directives help maintain a patient's autonomy and may help unburden family members and treating physicians from making difficult medical decisions based on the individual's best interest. We theorized that physicians at our institution were not discussing advance directives and that a limited understanding of the legal or ethical aspects of advance directive planning would be among the most commonly cited factors limiting the discussion of advance directives.

Methods: Attending and Resident Physicians in both primary and non-primary care disciplines at SJMO Hospital were invited to participate in an anonymous twelve-question survey about advance directives. Random and convenience samples of our survey were distributed from July 2018 through January 2019. Results were tallied, and a Pareto analysis was performed on the identified limiting factors.

Results: 96 surveys were received none of which were omitted. 84.0% of respondents believed it was their responsibility to initiate and facilitate a discussion about advance directives. Interestingly when asked how frequently physicians initiated a discussion about advance directives 34.7% selected that they only do so when the patient or the patient's family
brings the subject up. When asked when they initiated the discussion themselves 32.3% of respondents indicated that the only time they do so is when the patient has a poor prognosis regardless of the setting of the encounter. The majority of respondents 67% indicated "Time constraints during the patient encounter" as a limiting factor. Additionally, 29% of respondents identified "Language barriers" and 20% identified "Ethnic, cultural, or religious reasons" as limiting factors.

Conclusion: We found that as we had hypothesized physicians at our institution were not addressing advance directives. We can now develop strategies aimed toward addressing our identified barriers.

Phenobarbital versus Lorazepam for Alcohol Withdrawal Syndrome: A Retrospective Cohort Study

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Introduction: Alcohol is the most widely available and abused substance in the United States. Annually, about 500,000 episodes of withdrawal symptoms are severe enough to require clinical attention. The primary objective of this study is to compare the use of Phenobarbital versus Lorazepam in management of hospitalized patients with alcohol withdrawal in regards to hospital length of stay.

Methods: This is a retrospective cohort study over a two-year period (March/2016- March/2018) from three different hospitals within the St. Joseph Mercy Health System. A total of 1007 charts for patients admitted with a diagnosis of alcohol intoxication or withdrawal were reviewed. 606 patients met the inclusion criteria (543 in the Lorazepam cohort and 63 in the Phenobarbital cohort). Adjusted comparisons were done using propensity scoring methods. Hospital length of stay was set as the primary outcome. Secondary outcomes included 30-day readmission rate, number of Emergency Department (ED) visits within 30-days of discharge and need for Intensive Care Unit (ICU) transfer.

Results: Patients who received Phenobarbital had a statistically significant shorter length of stay as compared to patients who received Lorazepam (2.8 vs 3.6 days, P-value <0.001). Furthermore, the Phenobarbital treatment group had significantly lower rates of 30-day readmission (11.11% vs 14.18%, P-value 0.039) and ED visits within 30 days of discharge (11.11% vs 18.6%, P-value 0.014). No statistical significance was detected for ICU transfers between the treatment groups.

Conclusion: This is a pilot study that suggests a possible difference between Phenobarbital and Lorazepam in management of alcohol withdrawal syndrome. Current practice patterns need to be reconsidered through conducting studies of larger scale to corroborate these findings.

Long-term risk of recurrence in surgically treated renal cell carcinoma: a post-hoc analysis of the Eastern Cooperative Oncology Group - American College of Radiology Imaging Network E2805 Trial cohort

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ABSTRACT

Purpose
Surgery remains the standard of care for clinically localized renal RCC. The optimal follow-up period in these individuals is controversial, current recommendations are based on retrospective data, which inevitably contain attrition bias. Our objective was to re-visit the recurrence rates of surgically treated RCC using randomized clinical trial data.

Methods
We performed a post-hoc analysis of all the patients that were included in the ECOG-ACRIN E2805 Trial. Post-operative recurrence rates were assessed using the cumulative incidence method. Conditional estimates of a 36-month recurrence for patients who did not have recurrence at set intervals following surgery was performed. Assessment of routinely available clinical and pathological features in predicting disease recurrence at time 0-months after surgery was compared it to that of the same features at 60-months after surgery.

Results
The original cohort consisted of 1943 patients, all with intermediate- or high-risk disease. Median follow-up was 67.9 months. 730 patients developed disease recurrence. 36-month cumulative incidence of recurrence was found to be 31.1%, 26.0%, 18.8%, 16.1%, 18.9% and 20.3 for patients who did not have recurrence at 0, 12-, 24-, 36-, 48- and 60-months from surgery, respectively. At time 0-months from surgery, age (HR: 1.01), pathologic T3/4 stage (HR: 1.56), pathologic N1/2 stage (HR: 2.38), Fuhrman grade 3 and 4 (HR: 1.36 and HR: 2.41, respectively) were independent predictors of recurrence. Conversely, none of the aforementioned covariables were predictors of disease recurrence at 60-months following surgery.

Conclusions
Long-term follow-up, beyond 5-years, is supported by the findings within the present study. Also, the usual independent predictors that are frequently used to guide patient follow-up demonstrated validity immediately following surgery however lose their predictive power at 5 years from surgery.

CORRECTION OF HALLUX ABDUCTO VALGUS DEFORMITY UTILIZING CLOSING BASE WEDGE OSTEOTOMY: A STUDY OF 101 PATIENTS

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INTRODUCTION: Hallux abducto valgus is a functionally disabling deformity with lateral deviation of hallux and medial prominence of the first metatarsal head. Various surgical techniques have been utilized in the treatment of this deformity. In this retrospective review, we assess the outcomes of proximal closing base wedge osteotomy (CBWO).

METHODS & DESIGN: A single surgeon database was reviewed for patients who underwent proximal CBWO between January 1st, 2012 - December 31st, 2017. A total of 101 patients were identified with a mean age of 49 years (range, 13 to 80) and mean BMI of 29 kg/m^2 (range, 19 to 53). The medical records were reviewed for smoking status, time to heal, rates of nonunion, shortening of the 1st metatarsal, intermetatarsal angle, hallux valgus angle, elevatus, average loss of correction, complication rates, and pain scores. Pre- and post-operative variables were compared using Student's T-tests for continuous variables.

RESULTS: The mean pre- and post-operative intermetatarsal angle was 15.46 degrees (range, 10 to 21) and 3.77 degrees (range, 0 to 10; $p<0.05$). The mean pre- and post-operative hallux valgus angle was 34.57 degrees (range, 12 to 60), and 9.24 degrees (range, 0 to 30; $p<0.05$). The mean metatarsal length shortening was 3.72 mm. The mean post-operative elevatus was 2.73 mm.

DISCUSSION: We have demonstrated excellent outcomes of CBWO with correction of intermetatarsal and hallux valgus angles. This procedure allows for greater reduction of moderate to severe intermetatarsal angles in rigid first rays with minimal complications in the largest reported study. The mean post-operative elevatus of 2.73 did not result in any sequela.

Title: Visualization of IDH1 R132H Hypermethylator Phenotype with Stimulated Raman Scattering Microscopy

Authors: Spencer Lewis, Daniel Orringer

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Purpose: IDH1 mutational status is the most important prognostic factor on low grade glioma. Detection of IDH1 mutations currently requires immunohistochemical staining does not permit elucidation of IDH1 genotype intraoperatively. Knowing IDH1 status at the time of surgery yields valuable information on tumor aggressiveness and would thus be helpful in surgical planning. Stimulated Raman scattering (SRS) microscopy is a novel optical technique allowing rapid visualization of chemical moieties with subcellular specificity, which has already been used to image brain tumor histoarchitecture intraoperatively. The aim of this study is to determine whether SRS is able to differentiate IDH1 mutant from wild type cells.

Methods: We imaged two isogenic U87 cell lines expressing either wild-type IDH1 (WT, n=9.869) or IDH1 R132H (mutant, n=6,658) *in vitro* at seven spectral channels. An *ad hoc* image segmentation program was used to isolate spectra from nuclei. Linear discriminant analysis was then used to derive a classifier to differentiate the two cell lines based on a training set of n=99 WT and n=67 mutant cells (1% of the total dataset). This was then tested on the remaining 99% of the cells in the dataset.

Results: A linear classifier was able to discriminate WT and mutant cells with an accuracy of 99.3% (sensitivity 99.7%, specificity 98.9%, Wilks' lambda < 0.001).

Conclusions: Using a linear classifier, IDH1 WT and R132H cells can be discriminated *in vitro* based on the optical properties of their nuclei, without the use of immunohistochemical stains. Further studies applying this methodology to tissue may allow for the identification of IDH1 mutant tumors using a rapid optical technique which is conducive to intraoperative application.

TARGETTING INAPPROPRIATE STRESS ULCER PROPHYLAXIS: A MULTIDISCIPLANRY APPROACH

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Introduction: Stress ulcer prophylaxis (SUP), administration of acid suppressive therapies (AST) to prevent nosocomial gastrointestinal bleeding, is widespread outside of intensive care units despite a la9k of data supporting its efficacy, reportedly happening 40-90% nationally. Potential side effects include vitamin 812 deficiency, osteoporosis, clostridium difficile infection, and CKD. A multidisciplinary educational approach has been used to improve prescribing patterns in other disease states and will be used as a method to curb inappropriate SUP.
AIM Statement: To decrease inappropriate stress ulcer prophylaxis using a multidisciplinary academic detailing team on an inpatient internal medicine teaching service (IIMTS).
Methods: Using the quality improvement model plan-do-study-act (PDSA), we retrospectively collected baseline data on inappropriate SUP use on IIMTS over one month. We then implemented PDSA 1: academic detailing. A multidisciplinary team (clinical pharmacist plus internist),_gave teaching sessions on appropriate SUP indications to IM residents. We then collected prospective post intervention data.
Results: Prior to the intervention, 94 patients received AST, of which 66 (70%) were receiving AST prior to admission and 28 were prescribed AST upon admission. 12 (43%) of new AST therapies were considered inappropriate, whereas 16 (57%) were prescribed for appropriate indications. Post-intervention data is being collected to prepare for PDSA 2.

Discussion and Conclusion: Academic detailing as a means to change clinician practices through evidence based medicine, has been shown to have a risk difference of up to 16% in the literature. It was utilized in our inpatient setting, in an attempt to decrease inappropriate SUP. PDSA 2 will entail a hard stop in the chart requiring the health care provider to select a valid indication for SUP. This multimodal approach is being assessed as a means to reducing inappropriate SUP prescription.

Project Title: Access to Cancer-Directed Surgery in the United States after Medicaid Expansion: A Step Towards Reducing Health Disparities

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Background: Cancer incidence and outcomes are dependent on the population's socioeconomic status (SES) and access to healthcare. The Affordable Care Act (ACA) drastically changed healthcare in the United States (US). It expanded Medicaid eligibility to persons with income up to 138% of the federal poverty line. Insurance status is associated with an improved outlook in patients with cancer, and data after the global economic crisis of 2008 show that increased public expenditure in healthcare was able to alleviate the negative effects of the economic downturn on cancer-related mortality. In the US, the ACA represented a major legislature change, and its large-scale benefit for this population is largely unknown. Understanding the effects of the ACA on disparities in cancer care is of interest to the public, healthcare providers and policymakers.

Abstract: Objectives: We investigated the impact of Medicaid expansion (ME) on access to cancer-directed surgery. Moreover, we analyzed the differences in access to cancer-specific surgical procedures among economically disadvantaged communities and minorities.

Abstract: Methods: A nationwide population-based database (SEER) to identify patients with breast, colorectal, ovarian, lung, uterine, pancreatic, prostate, and liver cancer diagnosed between 2007 and 2015. Cases were assigned to the groups (pre- and post-ME) based on the day of implementation of ME on each state: Alaska (9/1/2015), California (7/1/2011), Connecticut (4/1/2010), Hawaii (1/1/2014), Iowa (1/1/2014), Kentucky (1/1/2014), Michigan (4/1/2014), New Jersey (4/14/2011), New Mexico (1/1/2014) and Washington (1/3/2011). Patients from Georgia, Louisiana and Utah comprised the Non-expansion states (NES). A highly reliable (Cronbach's α = 88.5%) SES score was created using counties' SES status determinants and their standardized differences from the population's mean. To compare outcomes pre- and post-ME, a quasi-experimental model based on unadjusted difference-in-differences (DiD) was used. Multivariate logistic regression adjusted for SES- and tumor-related covariates was also conducted.

Abstract: A total of 1,008,074 patients were included (pre-ME, 706,944[70.1%]; post-ME, 293,028[29.9%]). Patients had a median age of 56±7.9 years, and were mostly female (58.5%), White (63.8%), married (61.9%) and insured (80.7%). Stage I malignancies accounted for 28.7% of cases. Patients post-ME were diagnosed at an earlier stage (Stage I: pre-ME, 27.6%; post-ME, 31.1%; P<0.001). Post-ME, the percentage of uninsurance patients decreased from 5.5% to 2.6% (DiD -2.4%). Overall, no changes were observed in access to cancer-directed surgery between states with and without adoption of ME (DiD=+0.1%). However, patients from lower-SES had improved access to surgical care (MES: 94.3%-97.9%; NES: 97.3%-97.8%; DiD=+3.1%). Indeed, ME was an independent predictor of access-to-surgery (OR, 1.45; 95%CI, 1.39-1.51; P<0.001) in multivariate logistic regression analysis. African-American (OR, 0.583; 95%CI 0.559-0.609; P <0.001) and Hispanic (OR, 0.829; 95%CI 0.783-0.878; P<0.001) race were negative predictive factors of receiving cancer-specific operation.

Conclusions: Under the ACA and ME, the percentage of cancer patients without insurance decreased within the US. This was associated with earlier stage at the time of diagnosis and improved access to surgery in patients from economically disadvantaged communities. Despite these advances, inequality of care is still present, specially among minorities, and medical associations and political entities should continue to strengthen the political efforts to provide medical equity.

Push Enteroscopy in the Evaluation of LVAD Patients Presenting with GI Bleeding

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BACKGROUND: Patients with left ventricular assisted devices (LVADs) are at considerable risk of gastrointestinal bleeding (GIB) of about 23%. A significant portion of GIB occur in the stomach, duodenum or small intestine as compared with lower intestinal tract. A traditional work up for such patients differs between institutions but generally includes an esophagogastroduodenoscopy (EGD) and colonoscopy +/- RBC tagged scan. If the cause of GIB is not found, a capsule endoscopy or push enteroscopy (PE) is then pursued to evaluate for small intestinal bleeding, an area not accessible by other devices/ procedures including EGD and colonoscopy. The traditional approach requires considerable time and effort leading to a significant length of hospital stay. It also exposes the patient to multiple procedures with additive potential adverse effects and cost.

AIM: Our goal is to compare the traditional work up/ management of GIB with an innovative approach of performing PE as the first diagnostic/therapeutic procedure to assess if the latter increases the diagnostic yield of GIB site detection with fewer procedures per hospital admission, shortens the length of hospital stay, and decreases all-cause mortality

METHODS: This is a retrospective study was performed in Henry Ford Hospital in Detroit, MI. ICD-9 and ICD-10 diagnosis codes were used to generate a list of LVAD patients who were admitted with an overt GIB or worsening anemia in the period from 1/1/2013 to 12/25/2018. Our primary outcomes were the rate of detection of GIB lesion/site and all-cause mortality. Secondary outcomes were the number of packed red blood cell (pRBC) units transfused during the hospitalization and the length of hospitalization. Chi-square, Fisher exact, paired-T tests and Pearson correlation were used for statistical analysis. The study protocol was approved by the hospital's IRB. RESULTS: A total of 227 patients were reviewed. 89 patients were included with a mean age 61.36 years-old. The majority of patients (75.28%) were > 55 years-old and 70.78% of patients were males. All patients were on anticoagulation and 53 patients were on antiplatelets as well. The patient's prestation were as follows: 38 patients presented with melena, 11 with hematochezia, 7 with hematemesis or coffee ground emesis and 33 patients with worsening anemia without overt GIB. A total of 71 patients underwent the traditional approach at the first index endoscopy, whereas 18 patients started with PE +/- colonoscopy. The source of GIB was detected at the first index endoscopy in 51 patients (36 traditional approach and 15 in PE approach). Arteriovenous malformation was the most common lesion detected (29 patients) and the two most common sites of bleeding were gastroduodenal followed by the small bowel. Doing PE at the first index endoscopy was associated with a higher rate of GI site detection, OR 4.861 (95% CI (1.293-18.271), P = 0.012), this was true, especially when patients presented with worsening anemia without overt bleeding, OR 11.2 (95% CI (1.202-104.33), P = 0.015). There was no statistically significant difference between both approaches in terms of all-cause mortality (P = 0.163). Patients in the PE group did have a shorter hospital stay ($\bar{x}$ (SD) = 10.78 (13.97) days compared to 18.8 (25.58) days for the traditional approach) with P value = 0.034. No statistically significant difference in the number of pRBC units (P = 0.121). Finally, INR value on presentation was not associated with a higher risk of all-cause mortality P = 0.905 and didn't correlate with a statistical significance with number of pRBC units and length of stay (P = 0.839 and 0.644 respectively)

Conclusion: PE is a safe procedure. It increases the GIB site detection and shortens the length of hospital stay when considered on the initial evaluation of LVAD patients presenting with GIB in general and worsening anemia in specific.

Trends of 5-ASA Medication Use in Patients with Crohn's Disease

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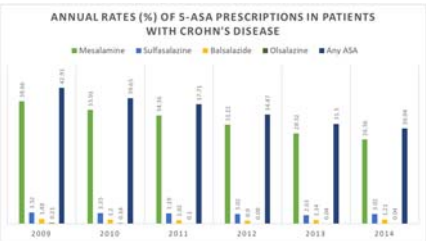
Introduction and Significance: Aminosalicylate (5-ASA) medications have a long history of use for the treatment of inflammatory bowel disease (IBD) and continue to be widely prescribed today. However, studies have demonstrated little benefit for induction or maintenance treatment of Crohn's disease. We aimed to quantify usage and examine the trends in 5-ASA prescription rates in patients with Crohn's disease using a national cohort.

Methods and Design: We queried a national database of commercially insured patients (Truven Health Marketscan databases) between 2009 and 2014 to identify patients with Crohn's disease aged 18-65 years. Patients were excluded if they carried any ICD-9 code for ulcerative colitis. Prescription rates for 5-ASA medications including sulfasalazine, mesalamine, olsalazine, and balsalazide were calculated for each calendar year. Linear regression models were used to examine trends in prescription rates across the calendar years.

Results: We identified a total of 132,804 patients with Crohn's disease. About one third of all patients received a 5-asa prescription. The overall prescription rates for 5-ASA medications declined from 42.9% to 30.0% between 2009 and 2014, respectively ($p<0.001$). Amongst all 5-ASA medications, mesalamine was the most commonly used (38.7% to 26.6%), followed by sulfasalazine (3.5% to 3.2%), balsalazide (1.5% to 1.2%), and olsalazine (0.2% to 0.04%) between 2009 and 2014, respectively. All medications showed statistically significant decrementing trends except for balsalazide.

Discussion/Conclusion: About 1 in 3 privately insured patients with Crohn's disease receives a 5-ASA prescription despite the lack of evidence demonstrating efficacy. In an encouraging trend, prescription rates have significantly decreased between 2009 and 2014. The high prescription rate may reflect a gap in provider's knowledge regarding the recommended therapy guidelines. As such, efforts are needed to educate providers about the effective management strategies for patients with Crohn's disease and the distinction from ulcerative colitis. The modest effectiveness of sulfasalazine, especially for extraintestinal manifestations, in Crohn's disease needs to be considered in further analysis.



Does Prior Exposure to Death and Dying Impact Discussing End-of-Life Wishes?

Melissa Patterson, MD, MBA; Jeanette Wilson, MD; Karen H. Hagglund, MS. Family Medicine.

Introduction: Most people hope for a "good death" where the quality and dignity of life are preserved, but may instead experience a chronic decline confounded by physical, cognitive, and emotional impairments. Patients are curious about death, but few will say so to their physicians. Family medicine physicians should recognize the difficulty that patients may have when discussing end-of-life (EOL) wishes, especially among patients without prior exposure to death.

Objective: To determine if exposure to death and dying increases a patient's likelihood of discussing EOL care with their physician and having an advance directive.

Materials and Methods: We conducted a voluntary survey of adult patients seen at two family medicine clinics. Medical assistants approached patients, distributed the surveys with a cover letter, and collected them. The surveys gathered information on demographics, whether the patient had thought about EOL wishes, discussed EOL wishes with a loved one or their physician, the patient's previous exposure to death and EOL wishes, and whether they had an advance directive. We then checked whether an advance directive was documented in the chart. Data were analyzed using the chi-squared test and Student's t-test.

Results: A total of 262 surveys were collected; patients' mean age was 49.2 ± 16.2 years; 71% were female. Although most (59%) patients indicated that they had thought about EOL wishes, few (9%) had this discussion with their physician. No association was found between a patient's exposure to death and dying and the likelihood of having discussed EOL wishes with their physician ($p=0.35$) or having an advance directive ($p=0.38$). Patients who spoke to their physician about EOL wishes were more likely to have an advance directive than those who did not (32% vs. 14%, $p=0.05$).

Conclusions: Few patients have discussed EOL care with a physician. Exposure to death was unrelated to discussing EOL wishes or having an advance directive. Implementing standardized guidelines for discussing and documenting EOL wishes could help clinicians and patients better navigate the process of death and ensure medical care that is consistent with a patient's values, goals and preferences.

OPIOID REQUIREMENTS IN LAPAROSCOPIC COLECTOMIES: DO ERAS PROTOCOLS MAKE A DIFFERENCE?

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Background

Laparoscopic colorectal surgery has well-documented advantages compared to open surgery with respect to postoperative pain control. The addition of enhanced recovery after surgery (ERAS) protocols has demonstrated discernible improvements in a variety of outcome measures. Using a multimodal approach to analgesic requirements, ERAS is able to avoid narcotic-exclusive pain regimens. With the growing opioid epidemic and recent focus on the quantity of opioids prescribed at discharge after surgery, ERAS provides another tool to counteract this epidemic. The aim of this current study is to analyze the differences in opioid requirements and pain scores in the immediate postoperative period for patients who underwent laparoscopic colectomies before and after the implementation of ERAS protocols.

Methods

A retrospective chart review of all patients undergoing elective laparoscopic colectomies at Beaumont Health in Royal Oak, Michigan, was performed. There were two patient cohorts: pre-ERAS (December 2013 to July 2015) and ERAS (September 2015 to May 2018). Patient characteristics were collected along with pain scores and postoperative opioid requirements in morphine milligram equivalents (MME) for the first 48 hours. Categorical variables were analyzed with the chi-square test and Fisher's exact test when appropriate. Continuous variables were compared using the paired t-test or Mann-Whitney U test.

Results

A total of 242 patients (122 pre-ERAS and 120 ERAS) were studied. Patient characteristics were similar between groups. Pain scores were higher in the pre-ERAS patients for postoperative day (POD) 0 and 1; however, only POD 0 scores were statistically significant ($p = 0.019$). There was a significant decrease in the MME on POD 0-2 for the ERAS patients. This decrease resulted in a 62% reduction in opioid requirements from pre-ERAS to ERAS patients (44.6 vs. 17.0 MME, $p < 0.0001$). There was also a reduction in the total MME prescribed at discharge after ERAS implementation (162.9 vs. 145.5 MME, $p = 0.03$).

Discussion/Conclusion

In this study, ERAS helped reduce opioid requirements after elective laparoscopic colectomies without negatively affecting pain scores. Although there was a minor reduction in the total MME prescribed at discharge between the two cohorts, this difference was not seen as clinically significant. Ultimately, ERAS protocols provide a pathway to reduce opioid requirements after surgery, but further education is needed to resolve overprescribing patterns.

TEACHING BILLING AND CODING IN A RESIDENCY PROGRAM WITH A PLAN FOR IMPROVEMENT

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Introduction: Many residency programs are challenged with balancing preceptor roles while aiming to accurately code high-complexity visits. Guidelines from the Centers for Medicare and Medicaid Services allow residents to see, treat, and bill low to moderate-complexity visits independently. We are challenged to teach the proper use of electronic medical records and the correct way to bill and code according to guidelines while teaching the practice of medicine. In our practice self-assessment, we found we had an opportunity for improvement in our documentation and high-complexity coding for all providers. Our aim was to provide education and feedback to all providers to help improve our coding according to guidelines and decrease under-coding, as well as analyze and improve the financial impact of accurate billing and coding.

Methods: Participants included 27 family medicine residents and 15 faculty attendings. Billing and coding data were collected for each physician and categorized into low-moderate and high-complexity billing. These data were presented to physicians to review and an educational lecture was given on accurate coding guidelines. Three months later, data were re-analyzed and given to physicians to review. Guidelines were again reviewed, and coding cards given to residents to help aid them in office sessions. Data were again re-analyzed 4 months later to determine the impact of feedback interventions on improvement of coding practices. Groups (PGY1, PGY2, PGY3, and faculty) were compared using the Paired t-test with $P<0.05$ considered significant.

Results: There was significant improvement in 99213/99214 coding ratio for both PGY2 and PGY3 residents at 3 months and 7 months after the first intervention. There was no significant change in coding ratio for faculty and PGY1 residents

Conclusions: In our project, we determined that data feedback does have significant impact on improvement in billing and coding and therefore, increased revenue for our practice.

OUTCOMES OF ELECTIVE RIGHT VS. LEFT COLECTOMY FOR COLON CANCER IN VETERANS

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Introduction:

Right colectomy (RC) is perceived to be technically easier and to have fewer complications compared with left colectomy (LC). This study examines the outcome differences between RC and LC in the Veteran population.

Methods:

We identified patients who underwent elective RC or LC with primary anastomosis for colon cancer in the VASQIP database from 2007-2015. Rectal cancer and emergency cases were excluded. Data included demographics, surgical approach, operative variables, postoperative morbidities, and 30-day mortality. Univariate and multivariate analyses were used and $p<0.05$ was considered significant.

Results:

A total of 3,631 patients [Males (97%), Females (3%)] were included. There were 1,299 (35.7%) RC and 2,332 (64.3%) LC. RC patients were more likely to be ≥ 65 years old [RC 65.5% Vs. LC 52.0% ($p<0.001$)], have higher ASA (≥3) [RC 87.1% Vs. LC 83.4% ($p<0.003$)], and have ≥1 comorbidity [RC 79.0% Vs. LC 75.8%) ($p=0.03$)]. A minimally invasive approach was used in 32.1% RC and 31.0% LC ($p=0.55$). Operative time (hours) was shorter in RC [RC 2.7 Vs. LC 3.2 ($p<0.001$)]. There was no significant difference in length of stay (LOS days) [RC 8.5 Vs. LC 8.4 ($p=0.94$)] or 30-day mortality [RC 2.2% Vs. LC 1.8%) ($p=0.53$)]. Overall postoperative complications were not significantly different; however, RC patients were more likely to have ≥1 major complication that increased LOS [Odds Ratio (OR) 1.18; $p=0.02$]. Significant independent predictors of any complication were: dependent functional status (OR 1.91; $p<0.001$), wound classification 3/4 (OR 1.67; $p=0.03$), anemia (OR 1.7; $p=0.005$), undergoing RC (OR 1.18; $p=0.02$), ASA ≥3 (OR 1.67; $p<0.001$), and operative time >3 hours (OR 1.23; $p=0.003$).

Conclusion:

Veterans undergoing elective RC are older, have more comorbidities, and more major complications compared with LC, yet demonstrated similar LOS and mortality, perhaps due to less operative time and trauma. These factors should be considered in preoperative risk assessment and scoring.

Opioid Prescribing Trends: A Comparison of Focused Resident Intervention and State of Michigan Mandates

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Introduction: Opioid dependence is a current societal problem that is ravaging the country and particularly the state of Michigan. Recognizing the role that surgeons play in contributing to the opioid epidemic, our General Surgery residency program instituted a voluntary decrease in post-operative opioid prescriptions in February 2018 via an educational session, prior to the State of Michigan mandated decrease in June 2018.

Objective: To determine if opioid prescribing for post-operative laparoscopic cholecystectomy decreased after the hospital educational session and the state of Michigan mandate.

Materials and Methods: We conducted a retrospective review of electronic medical records. Outpatient laparoscopic cholecystectomy (LC) was chosen as a proxy for a general surgical outpatient procedure. Opioids prescribed on discharge were converted to morphine milligram equivalents (MME). Three time-periods were analyzed: period one, pre-educational session (10/1/17 – 1/31/18); period two, post-educational session (2/1/18 – 5/31/18); period three, post-State of Michigan mandates (6/1/18-9/30/18). Data were analyzed using analysis of variance followed by multiple comparisons with the Scheffé adjustment of the p-value.

Results: Period one had 39 cases; period two had 43 cases; period three had 47 cases. The mean MME prescribed for LC were: period one, 112.1 ± 46.2, period two, 75.1 ± 33.1, and period three, 58.4 ± 26.2. MME differed among the three study periods ($p<0.0001$). MME prescribed during periods two and three were both lower than for period one ($p <0.0001$). MME prescribed during period three did not differ from period two ($p = 0.09$).

Conclusions: MME prescribed after outpatient LC significantly decreased over the study periods. This suggests that the surgery residents began self-monitoring opioids prescribed on discharge after the educational intervention and before the law limiting opioid prescriptions went into effect. This study gives a baseline on prescribing practices and provides an idea of MME prescribed for a common procedure. This study can lead to further awareness and reduction in MME prescribed. Additionally, this study is a model for resident-driven change in patient care practices.

Buprenorphine Waiver Training for Psychiatry Residents: A Response to the Opioid Crisis

Mustafa Taquee M.D., Renee Bayer M.D., Brandon Moore M.D.*

Introduction: Drug overdose deaths continue to increase. Three out of five overdose deaths involve an opioid (1). In 2016, opioid overdose deaths were 5 times higher than in 1999 (2).

1. To identify methods to improve psychiatry resident interventions for patients struggling with opiates.
2. To improve residents knowledge, understanding, and ability to prescribe buprenorphine.

Method and Curriculum: We reviewed current successful resident interventions related to opiate use disorders. We surveyed current residents regarding buprenorphine waiver training. We coordinated with the APA to offer the eight hour waiver training videos as a group over two regularly scheduled didactic afternoons. Following the intervention, residents were given a post intervention test, and provided a link to register that they completed the waiver training. Information is provided to residents on how to register to prescribe buprenorphine post-graduation.

Results:

In 2019, we offered buprenorphine waiver training to thirteen PGY3 and PGY4 psychiatry residents.

Buprenorphine Waiver Training & Survey	Pre	Post
Completed training	0%	53%
Agreed or strongly agree to feeling adequately trained	0%	100%
Plan to prescribe	29%	57%

Conclusions and Recommendations: Brief didactic interventions can produce significant changes in resident attitudes regarding opiate users, and increase prescribing rates of agents effective for treatment of opiate abuse (3). Our intervention was small, and not statistically significant. However, as it was inexpensive, used regular didactic training time, and relatively effective in helping residents feel adequately trained to prescribe and modestly effective in increasing the number of residents planning to prescribe, we plan to continue to offer this training to psychiatry residents. We are recommending considering mandatory buprenorphine waiver training, and providing the training earlier in residency. Other possible follow-up research may include tracking how many graduates attain the waiver post-graduation. Further research may include tracking the percent of graduates who are actually prescribing buprenorphine in their subsequent psychiatry practice.

Comparison of Admission Rates Among Patients Treated by Male and Female Emergency Physicians: A Multicenter Study

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Objective:. No paper to date has looked at gender of emergency medicine (EM) physicians in the United States as a function of adult admission rates. Our objective is to investigate admission rates of adult patients that were treated by female vs male EM physicians, to identify whether a practice pattern bias exists.
Methods: Design: Multicenter retrospective study, 4 community hospitals. Population: Patient encounters, July 1, 2016 to June 30, 2017. Outcome: Compare admission rates, patient acuity, length of stay, return visits, patient age, and years of practice using descriptive statistics and Pearson Correlation Coefficients.
Results: 109,543 encounters, treated by 77 EM physicians: 30 females and 47 males. Total visits: female 2430, male 2288, p=0.58. Average admission rates: female 29.6%, male 26.5%, p=.082. Acuity: female 148.7, male 144.5, p=.068. Average length of stay (minutes): female 293.6, male 267.6, p = .032. Average patient age: female 50.8, male 49.8, p=.285. Median time of encounter: female 12.7, male 12.9, p=.798. Years of practice: female 16.2, male 20.1, p=.084. Average returns visits per one thousand: female 8.4, male 8.3, p=.839. Levene's Test for Equality of Variances: all variables have p>.05. Secondary analysis of Pearson Correlation Coefficient of significance; admission rate and length of stay: female 0.53, p=.0026; male 0.76, p <.0001. Admission rate and acuity: female 0.56, p =.0012; male 0.76, p<.0001
Conclusion: There is no statistically significant difference between the admission rates of male and female emergency medicine physicians. For both groups, admission rate had the highest correlation with acuity of patients and length of stay.

Intravenous and oral tranexamic acid are equivalent at reducing blood loss in thoracolumbar spinal fusion: a prospective randomized trial

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Introduction: The use of antifibrinolytic agents such as tranexamic acid (TXA) to decrease operative blood loss and allogenic blood transfusions is well documented in the literature. While evidence supports the use of intravenous (IV) and topical formulations of TXA in spine surgery, the use of oral (PO) TXA has not been studied. The objective of the study is to compare perioperative blood loss in patients undergoing elective posterior thoracolumbar fusion who were treated with IV versus PO TXA.

Methods: A prospective randomized trial of patients enrolled at a university affiliated tertiary medical center between February 2017 and October 2018. 171 patients undergoing thoracolumbar fusion were randomized to receive 1.95g of PO TXA 2 hours preoperatively or 2g IV TXA (1g before incision and 1g before wound closure) intraoperatively. The sample was further stratified into 3 categories based on number of levels fused (1-2 level fusions, 3-5, and >5). The primary outcome was the reduction of hemoglobin. Secondary outcomes included calculated blood loss, drain output, postoperative transfusion, complications, and length of hospital stay. Equivalence analysis was performed with a two one-sided test (TOST). A P-value of <0.05 suggested equivalence between treatments.

Results: 91 patients received IV TXA and 80 patients received PO TXA. Patient demographic factors were similar between groups except for Age, Weight, and BMI. The mean reduction of hemoglobin was similar between IV and PO groups (3.48 g/dL vs. 3.19 g/dL, respectively; P = 0.004, equivalence). Similarly, the calculated blood loss was equivalent (1274 mL vs. 1206 mL, respectively; P = 0.001 equivalence). In addition, higher ASA (American Society of Anesthesiologists) level and longer surgical time were associated with more hemoglobin reduction (P = 0.01 and P < 0.001, respectively) and blood loss (P < 0.01 and P < 0.001, respectively).

Discussion and Conclusion: Patients treated with IV and PO TXA experienced the same perioperative blood loss after spinal fusions. Given its lower cost, PO TXA represents an excellent alternative to IV TXA in patients undergoing elective posterior thoracolumbar fusion and may improve healthcare cost-efficiency in the studied population.