



AMERICAN COLLEGE OF SURGEONS  
*Inspiring Quality:  
Highest Standards, Better Outcomes*



CONNECTICUT CHAPTER  
of the American College of Surgeons  
Professional Association, Inc.



# ABSTRACTS

## 2017 Annual and Scientific Meeting

### Resident Paper Competition Abstracts

October 20, 2017  
*Farmington Marriott Hotel*

*The Stamford Hospital is accredited by the Connecticut State Medical Society to sponsor continuing medical education for physicians. The Stamford Hospital designates this educational activity for a maximum of 8.0 AMA PRA Category I Credit(s)<sup>™</sup>. Physicians should only claim credit commensurate with the extent of their participation in the activity.*

*The purpose of this meeting is to provide attendees with a forum for the latest information regarding clinical practice and research in the field of surgery. Surgical Residents have a continued need to improve the research skills and a forum to present their research. Rural surgeons have a need to learn about emerging technologies. There is an on-going need to enhance patient safety and quality of patient care.*

**All sessions are open to all meeting attendees.**

***Uniting Surgeons to  
Advance Patient Care in Connecticut***

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**See map on next page for room locations**

Abstracts printed in order of presentation.

Prizes awarded in the following categories:

	First Place	Second Place
Trauma	X	X
Clinical Oncology	X	X
General Surgery 1	X	X
General Surgery 2	X	X
Specialty Surgery	X	X
Plastic & Reconstructive Surgery	X	X
Quality/NSQIP & ERAS	X	X

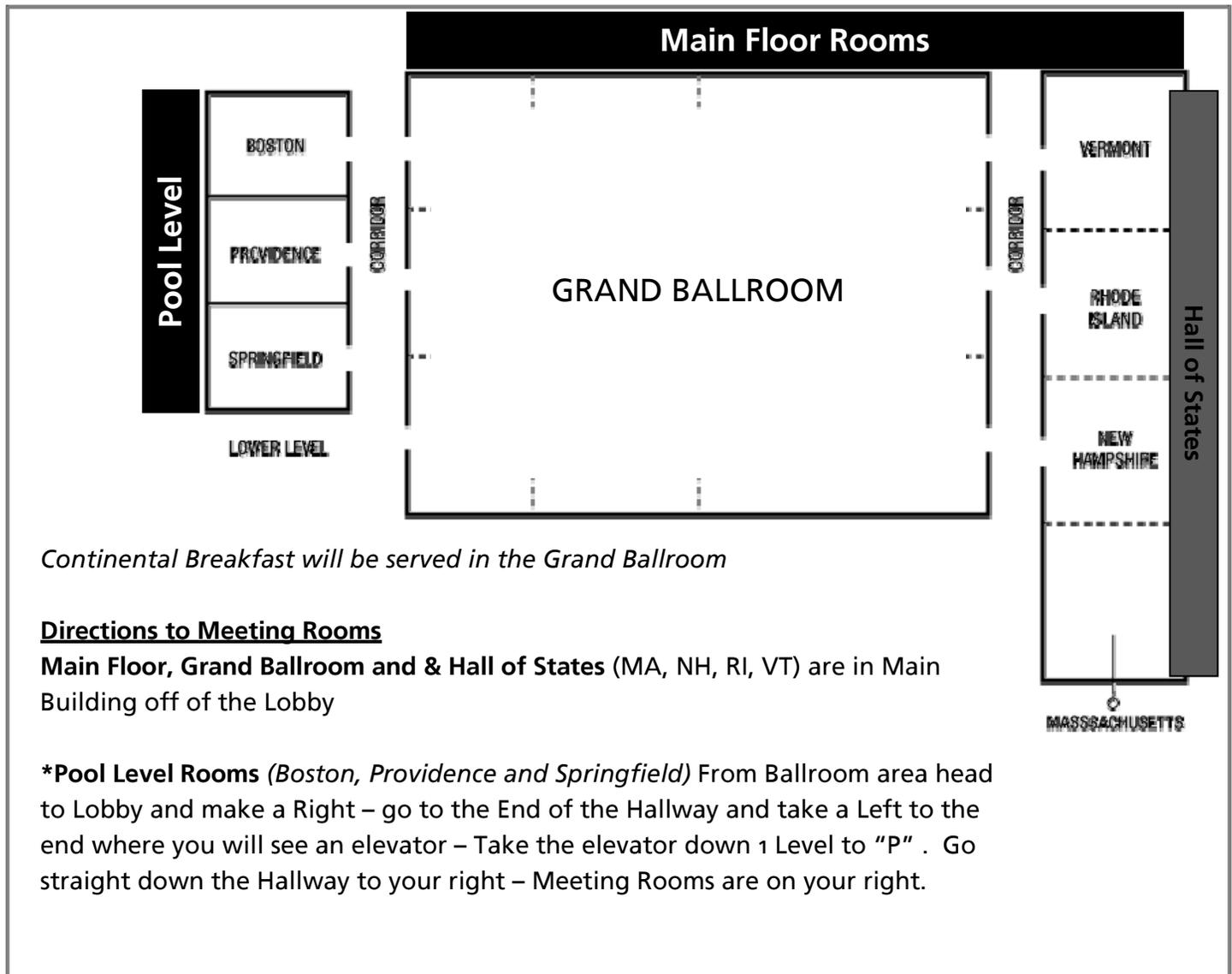
# Map of the Farmington Marriott

## Pool Level\*

General Surgery 1: ..... Boston  
 General Surgery 2: ..... Providence  
 Quality:..... Springfield

## Main Floor

Trauma: ..... Vermont  
 Cancer/Plastic: ..... New Hampshire  
 Specialty Surgery: ..... Rhode Island



*Continental Breakfast will be served in the Grand Ballroom*

## Directions to Meeting Rooms

**Main Floor, Grand Ballroom and & Hall of States (MA, NH, RI, VT)** are in Main Building off of the Lobby

**\*Pool Level Rooms (Boston, Providence and Springfield)** From Ballroom area head to Lobby and make a Right – go to the End of the Hallway and take a Left to the end where you will see an elevator – Take the elevator down 1 Level to "P" . Go straight down the Hallway to your right – Meeting Rooms are on your right.

# Order of Presentation – Summary

## 2017 CTACSPA Annual Resident Paper Competition

### Order of Presentation - Competition 10/20/2017 9:15AM - Listed by Category and Presenter Name

#### General Surgery 1 - Boston Room

Michael Smith, MS	Quinnipiac University	A Case of Fecalith Obstruction Formed at the Site of a Small Bowel Anasto
Will Vosburgh, D.O	Saint Mary's Hospital	Embolization of intercostal artery pseudoaneurysm in a patient with a me
Robert Kimmel, MD	Waterbury Hospital	Case Report: Metastatic Merkel Cell Carcinoma with Deep Groin Dissectio
Joel Calafell, MD	University of Connecticut	Diverticulitis of the Appendix: Rare but Real.
Courtney Collins, MD MS	St. Francis Hospital	Effect of Enhanced Recovery After Surgery Including Transversus Abdomin
Basil Nwaoo, MD	Stamford Hospital	Abdominal Cocoon Presenting as Bowel Infarction
Olajide Abiola, Medical Student	University of Connecticut	Abdominal Necrotizing Fasciitis Masquerading as Cushing's Disease: A Sur
Aaron Gilson, DO	Waterbury Hospital	Mosquito Netting As A Low Cost Alternative To Hernia Mesh In Liberia.

#### General Surgery 2 - Providence Room

Kristen Errico, BS	Quinnipiac University	Laparoscopic Repair of a Perforated Duodenal Ulcer with a Falciform Ligar
Kristin McCoy, MD	Stamford Hospital	Is robotic assisted laparoscopic inguinal hernia repair superior to open re
Santosh Swaminathan, MD	Saint Mary's Hospital	Metastatic Penile Cancer-A Lesser Known Evil: A Case Report from a Comr
Diane Durgan, MD, MPH	Stamford Hospital	Invasive ductal carcinoma discovered on excisional biopsy within an intr
Daniel Slack, MD	Waterbury Hospital	Firefly –Flip a Switch to See the Ureter. Use of Indocyanine Green for Loca
Ishna Sharma, BS, MD	University of Connecticut	Use of Alginate-based Substance for Repair of Tracheal Injury
Mohammad Ali, MD	Waterbury Hospital	Primary repair with suture for common bile duct injury during a robotic as
Walter Hsiang, BS	Yale University School of Medicine	The Effect of Insurance Type on Access to Inguinal Hernia Repair Under th

#### Cancer and Plastic & Reconstructive Surgery - New Hampshire

Ann Friedrich, MD	Saint Mary's Hospital	Does Cancer Stage and Type of Surgery Predict Readmission Events among
Virginia Parker, MD	Saint Mary's Hospital	Transmural Necrosis of the Colon in a Patient with Metastatic Non-Small C
John Calhoun, M.D.	Stamford Hospital	Diffuse parietal pleural carcinoid nodules identified during resection of rig
Muhammad Rishi, MD	Saint Mary's Hospital	Combining Innovative Technology with Contemporary Surgical Technique: r
Diego Accorsi, MD	Saint Mary's Hospital	Lung Adenocarcinoma Manifesting as a Metastatic Axillary Mass
David Kull, MD, MPH	University of Connecticut	Accuracy of 3D MRI Based Volumetry for Preoperative Estimation of Breas
Robin Wu, BS	Yale University School of Medicine	The Challenges of Redo Orthognathic Surgery
Daniella Vega, MD	Hartford Hospital	Excision of a Massive Facial Tumor in Ecuador: A Case Study in Global Surg
Julian Huang, AB	Yale University School of Medicine	Factors Associated with Reconstruction in Patients Undergoing Mastector

#### Quality - Springfield

David Shapiro, MD, MHCM	Saint Francis Hospital	Surgical High Reliability Program: SHaRPening the tools of the trade
Jennifer Hubbard, MD	Saint Mary's Hospital	The Impact Of Electronic Medical Records Documentation On Surgical Res
James Clarke, MD	Stamford Hospital	Resident involvement in Colon Protocol leads to decreased Surgical Site In
Mary Ann Mecca-Monahan, PA-C	Saint Francis Hospital	"Enhanced Recovery in the Elderly, Diabetic and High Risk Patient"
James Berry, MD	University of Connecticut	The impact of an Enhanced Recovery program on outcomes after laparosc
Jahnavi Kakuturu, MD	Saint Mary's Hospital	Markers of Malnutrition in Patients Undergoing Esophagectomy: An NSQI

#### Surgical Specialties - Rhode Island

Devin Gillaspie, MD	Danbury Hospital	Mycotic Pseudoaneurysm of the Superior Mesenteric: Case Report in Pati
Alexandra Dubinskaya, MD	Saint Francis Hospital	RETROSPECTIVE STUDY OF REMISSION AND RECURRENCE OF VULVAR LIGI
Jacob Campbell, DO, MPH	University of Connecticut	Bioengineered Nanofiber Scaffold Loaded with Resveratrol Improves Card
Alexandra Sanowski-Bell, MD	Waterbury Hospital	Cricopharyngeal Myotomy: A Novel and Definitive Surgical Approach to D
Hebron Obaid, MD	Stamford Hospital	Intralobar Pulmonary Sequestration
Marissa Novack, MD	Stamford Hospital	Banding as an Alternative Treatment Therapy for Bleeding after Transrect
Alexandra Dubinskaya, MD	Saint Francis Hospital	Male knowledge of his partner's contraceptive method and likelihood of f
Peter DeVito	Hartford Healthcare	The truly extra-anatomical bypass; the ethical pitfalls surrounding utility i

#### John D. MacArthur, MD, FACS Trauma Competition - Vermont Room

Walter Hsiang, BS	Yale University School of Medicine	Preoperative Opioid Dependency is Independently Associated with Inferio
Laura Lamb, MD	Saint Francis Hospital	Is a Stepdown Unit Safe for Patients with Mild Traumatic Intracranial Hem
Suraj Panjwani, MD	Saint Mary's Hospital	Training to Intubate: A Randomized Comparison Trial of Direct vs. Glidesc
Brittany Davis, MD	Stamford Hospital	Roadside Initiatives on Pedestrian Safety May Decrease Severity of Injurie
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Jennifer Hubbard, MD	Saint Mary's Hospital	Fall In The Graduated Geriatric Patient: Predicting Acute Traumatic Findin
Lance DeRoss, MD	University of Connecticut	Potential Adverse Events as the Result of Emergent Application of Upper I

**John D. MacArthur, MD, FACS**  
**Trauma Competition**

Moderator:

Brendan Campbell, MD, MPH, FACS  
Associate Professor of Surgery and Pediatrics,  
University of Connecticut School of Medicine,  
Hartford, Connecticut,  
Chair, Connecticut Committee on Trauma

Judge:

Joseph Sakran, MD, MPA, MPH, FACS  
Director, Emergency General Surgery,  
Assistant Professor of Surgery,  
The Johns Hopkins Hospital

**Preoperative Opioid Dependency is Independently Associated with Inferior Clinical Outcomes After Trauma Surgery**

Walter Hsiang BS, Catherine McGeoch BS, Sarah Lee BS, Robert Becher MD, MS, Kimberly Davis, MD, MBA, FACS, FCCM, Kevin Schuster, MD, MPH, FACS, FCCM  
 Yale School of Medicine

**Introduction:** Increasing use of opioids have led to greater rates of overdose, hospital admissions, and mortality. Studies of trauma have commonly focused on outcomes associated with acute intoxications rather than long-term addiction. We hypothesized that clinical outcomes would be different among opioid naïve and opioid dependent patients after injury.

We reviewed all adult patients admitted to the trauma service at an academic level I trauma center in 2016 with an Injury Severity Score (ISS) ≥ 5. Opioid dependent (OD) patients were identified through chart review and verified through the state based prescription monitoring program. Patients were further categorized by their pattern of opioid use into Prescription Abuse (PA), Illicit Abuse (IA), or Chronic Pain (CP) subgroups. The primary outcome measure was length of stay (LOS). Secondary outcomes included major complications, mortality, non-home discharge, ventilator days, and readmissions. Regression models were adjusted for patient demographics, insurance, ISS, and comorbidities.

**Results:** Of the 1450 patients who met the inclusion criteria, 17.9% were characterized OD. Among OD patients, 30.1%, 27.0%, and 42.9% were PA, IA, CP patients, respectively. After covariate adjustment, OD patients when compared to Opioid Naïve (ON) patients had longer LOS and ventilator days, more non-home discharges and readmissions, but no differences in mortality or major complications (Table). Opioid subgroup analysis revealed differences in LOS, non-home discharge, readmissions, and major complications.

Table: Clinical outcomes in opioid dependent patients

	Length of stay % longer	Ventilator days % longer	Non-home discharge odds ratio	Readmissions odds ratio	Major Complications odds ratio	Mortality odds ratio
Opioid naïve	0 (Ref)	0 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
Opioid dependent	22.6% (5.9%, 41.9%)**	68.5% (1.2%, 180.6%)*	1.47 (1.03, 2.11)*	1.80 (1.16, 2.80)**	1.33 (0.94, 1.89)	1.82 (0.64, 5.20)
Prescription abuse	17.0% (-9.2%, 50.7%)	97.7% (-5.4%, 313.4%)	2.44 (1.32, 4.51)**	1.93 (0.91, 4.06)	2.09 (1.15, 3.77)**	1.83 (0.35, 9.47)
Illicit abuse	44.0% (10.9%, 87.0%)**	10.1% (-59.0%, 195.8%)	1.77 (0.93, 3.36)	1.53 (0.66, 3.54)	0.80 (0.40, 1.60)	1.02 (0.10, 9.89)
Chronic pain	14.9% (-6.0%, 40.6%)	71.3% (-18.9%, 261.6%)	1.00 (0.62, 1.63)	1.86 (1.05, 3.28)*	1.30 (0.81, 2.08)	2.2 (0.58, 8.33)

\*p<0.05, \*\*p<0.01

**Conclusion:** Among trauma patients, opioid dependency was detected in 17.9% of patients and is independently associated with inferior clinical outcomes. However, distinct opioid subgroups have different outcomes which may allow for targeted risk assessment and possibly intervention within trauma centers.

**Is a Stepdown Unit Safe for Patients with Mild Traumatic Intracranial Hemorrhages?**

Laura C. Lamb, MD<sup>1,2</sup> Monica M. DiFiori, BS<sup>1</sup> Joel Calafell, MD<sup>2</sup> Christopher H. Comey, MD<sup>1,2</sup> David S. Shapiro, MD, FACS, FCCM<sup>1,2</sup> James M. Feeney, MD, FACS<sup>1,2,\*</sup>  
 1. Saint Francis Hospital and Medical Center  
 2. University of Connecticut School of Medicine

**Introduction:** Traumatic brain injuries (TBIs) are a major source of disability in the United States. The ideal unit in

the hospital for patients with mild traumatic intracranial hemorrhages (ICHs) has not been elucidated. We sought to investigate whether patients treated in the surgical stepdown area had worse outcomes than those treated in the surgical ICU.

**Methods:** We compared patients with ICHs and a Glasgow Coma Scale (GCS) upon admission of 14 or 15 who went to the ICU to those who went to the stepdown area from April 2014 to November 2016. We compared age, gender, Injury Severity Score (ISS), admission GCS (14 or 15), operative intervention, discharge destination, hospital length of stay (HLOS), mortality, and cost between these two groups.

**Results:** Patients admitted to the ICU had a significantly longer HLOS. Admission costs for patients admitted to ICU were also significantly higher than their stepdown area counterparts. This was true for both total charges (p = 0.0001) and for net revenue (p = 0.002) (table 2). There was no statistically significant difference in mortality, operative intervention, or discharge destination.

**Conclusion:** A surgical stepdown unit can be a safe disposition for patients with mild traumatic ICHs and represents an effective use of hospital resources.

**Training to Intubate: A Randomized Comparison Trial of Direct vs. Glidescope Laryngoscopy Amongst Inexperienced Users**

Paraag Chowdhary, Suraj Panjwani, Christian Edwards, Salim Abunnaja, Inam Shaikh, Kathie Matthews, J. Alexander Palesty  
 Yale School of Medicine

**Introduction:** Recently, video laryngoscopy (VL) with the help of Glidescope has been commonly used as an alternative to direct laryngoscopy (DL) during endotracheal intubation, especially managing the difficult airway. This study aimed to compare time to successful visualization and intubation using both these techniques amongst novice users in a normal (NA) and difficult airway (DA) simulated environment.

**Method:** This is a prospective randomized trial involving third year (MS-3), fourth year (MS-4) medical or physician assistant (PA-S) students, who had no previous experience with intubation. All students were uniformly trained in both techniques, allowed to practice and then randomized into either the DL or the VL groups. Each student was then asked to intubate in both NA and DA settings on the Laerdal Airway Management Trainer. Primary outcomes were time to visualization of the cord (TTV) and time to intubation (TTI). Secondary outcomes were number of attempts for successful intubation, incidences of esophageal intubation and dental trauma. Student's T test was used for statistical analysis.

**Results:** Thirty students (26 MS-3, 1 MS-4 and 3 PA-S) were randomly assigned into the DL (16) and VL (14) groups. In the NA setting, mean TTV and TTI did not differ amongst the DL and VL groups (TTV: 6 vs. 5s, p=0.38 ; TTI: 14.31 vs. 15.71s, p=0.67). The timings were also similar while intubating the DA (TTV: 5.56 vs. 5.85s, p=0.63 ; TTI: 15.31 vs.

14.07s, p=0.60). Intubation was successful on the first attempt in 100% of the cases in both groups with either level of difficulty. There were no incidences of esophageal intubation. In the VL group, there were two incidences of dental trauma (2/28, 7%), one during NA and one during DA intubation; whereas in the DL group, there were seven (7/32, 22%) such incidences, three during NA and four during DA intubation.

**Conclusion:** After appropriate training, novice users can successfully intubate either a normal airway or a difficult airway, irrespective of the laryngoscopy technique. Time to visualization or intubation does not differ significantly amongst the two techniques; however, dental trauma is more common with direct laryngoscopy.

	Direct (n=16)	Glidescope (n=14)	P value
<b>Normal Airway</b>			
Time to visualize (sec), Mean ± SD	6 ± 3.46	5 ± 2.51	0.38
Time to Intubation (sec), Mean ± SD	14.31 ± 8.85	15.71 ± 8.81	0.67
<b>Difficult Airway</b>			
Time to visualize (sec), Mean ± SD	5.56 ± 1.71	5.86 ± 2.18	0.63
Time to Intubation (sec), Mean ± SD	15.31 ± 7.14	14.07 ± 5.43	0.60

**Roadside Initiatives on Pedestrian Safety May Decrease Severity of Injuries in Cases of Pedestrians Struck by Motor Vehicles**

Brittany Davis, MD, Nicolle Burgwardt, MD, Josh Hajjar, BSN, RN, Kevin Dwyer, MD, FACS  
*Stamford Hospital*

**Introduction:** In the early 2010s, Stamford had one of the highest per capita rates of ED visits for pedestrians struck by motor vehicles (PS). The municipal government began implementing city-wide safety measures in late 2015 that included more cross walks and “no turn on red” signs. This study examines whether these measures has changed the natural history of such traumas.

**Method:** ED admissions data at Stamford Health, the city’s only trauma center, was retrospectively reviewed for PS trauma cases from January 2015 through December 2016. As implementation of safety initiatives was gradual in 2015, cases from 2015 were considered to be controls while cases in 2016 were considered the test cohort. Fatalities, GCS score on presentation, involvement of controlled substances, male gender, ED transfer to (acute care facility, ICU, OR, Morgue) and discharge disposition were compared between groups. Statistical analysis was performed using Fischer’s exact test and Chi Squared as appropriate.

**Results:** There were no significant differences in number of PS cases before and after implementation of safety initiatives. The rate of fatalities, gender of patients struck, GCS scores on admission, fatalities, need for operative intervention were also unchanged. Though there was a downtrend in the number of cases involving controlled substances (p=0.32), requiring transfer to the ICU, and ultimate discharge to acute care facilities (p=0.11) after safety measures, the small sample size limited achievement of statistical significance.

**Conclusion:** Our data suggest that overall severity of PS traumas has decreased since the implementation of roadside safety measures. However, the per-capita incidence of PS cases was unchanged. The study was limited by the relatively small sample size and short follow up time, thus future follow up may yield clearer findings.

Variable	2015	2016	p
# Peds Stuck	54	55	1.0000
Fatalities	2	3	1.0000
Female	24	23	0.5488
Utox+	7	3	0.3199
GCS < 10	3	2	0.6783
Transfer to ACF	3	1	0.3629
Transfer to ICU	8	4	0.2356
Transfer to Morgue	1	2	1.0000
Transfer to OR	0	1	1.0000
D/C ACF	5	1	0.1125
D/C Morgue	2	3	1.0000

**Failure to Obtain Operative Source Control is a Major Predictor of Death in Critically Ill Emergency General Surgery Patients**

Michael P. DeWane, MD; Kevin M. Schuster, MD, MPH; Kimberley A. Davis, MD, MBA; Robert D. Becher, MD, MS  
*Yale School of Medicine*

**Introduction:** Critically ill patients undergoing emergency general surgery (EGS) operations suffer higher rates of morbidity and mortality. Both preoperative and postoperative sepsis and septic shock have been shown to independently increase the odds of death. Obtaining surgical source control, combined with surgical critical care aimed at reversing the physiologic derangements associated with ongoing inflammation, are well known principles. Less well characterized is the impact on mortality of ongoing sepsis not brought under control in the operating room. We hypothesized that failure to achieve operative source control in critically ill EGS patients is a major predictor of death and an important prognostic indicator.

**Methods:** This study analyzed the American College of Surgeons National Surgical Quality Improvement Project’s database from 2012-2014. Patients who had undergone one of 10 common emergency general surgery operations and who postoperatively required intensive care (as indicated by requiring postoperative intubation for over 48 hours) were included. Four main patient cohorts of interest were studied: those without inflammation during their hospitalization; those who had only preoperative inflammation (defined as SIRS, sepsis or septic shock); those with both pre- and postoperative inflammation; and those with only postoperative (defined as onset prior to postoperative day 5) inflammation.

**Results:** A total of 5,705 critically ill patients were included for analysis; the overall 30-day mortality rate was 29.7% (1696). A majority of patients had some form of preoperative inflammation (80.4%, 4,586). Overall, mortality was lowest among patients without any preop or postop inflammation (21.3%, 162). Among patients who entered the operating room with preoperative inflammation, mortality was lowest among those who did not develop postoperative sepsis or septic shock (27.7%, 547) and highest among those who had ongoing sepsis or septic shock (33.6%, 877). Logistic regression demonstrated increased odds of death among critically ill patients with any level of inflammation; patients suffering from both pre- and postoperative inflammation had the greatest odds of 30-day mortality (Odds Ratio 2.06, p<0.001), as shown in the table below.

**Conclusion:** Persistent signs of sepsis during the post-operative period in critically ill EGS patients is a major independent predictor of 30-day mortality. The timing of onset of sepsis or septic shock are important prognostic indicators and have major implications on outcomes. This research further reinforces the importance of definitive and timely source control in patients with surgical causes of sepsis and septic shock.

Postoperative Patient Variables predicting 30-Day Mortality				
Variable	Odds Ratio	95% Confidence Limits		p value
Only Preoperative Sepsis	1.394	1.130	1.718	0.002
Preoperative Sepsis and ongoing Postoperative Sepsis	2.064	1.678	2.539	<0.001
New Onset Postoperative Sepsis	1.743	1.290	2.356	<0.001
Late Onset Sepsis (> postoperative day 5)	1.811	1.458	2.249	<0.001

**Head Injury Alert: A New Level Of Trauma Activation?**

Daniel Ricaurte MD, Daniel Slack MD, Peter Zdankiewicz MD, FACS  
*Waterbury Hospital*

**Introduction:** Trauma activation at a hospital requires mobilization of significant resources as well as person-nel. The trauma team (usually composed of multiple surgical residents, ED and/or Surgical at-tending and nursing staff), operating room, CT scan, X-ray technologists all have to be available to assist at short notice. Directly or indirectly, many other departments can be affected by a single trauma activation.

The Committee on Trauma of the American College of Surgery issued the updated Orange Book in 2014 with its latest recommendations for optimal care of the injured patient. Amongst trauma activation criteria was included elder patients that fall from standing on anticoagulation.

Based on our experience with this specific trauma population, we hypothesized that a new tier of trauma activation composed of a limited trauma team could maximize patient safety while mini-mizing time and resources.

**Method:** A "Head Injury Alert" was created to denote elder patients > 65 years of age who had fallen from standing height while anti-coagulated. The team, composed of an ED attending, a surgical resident and one nurse would triage and evaluate the patient with the goal of obtaining

a CT scan of the head within 30minutes of presentation. At any time, the Head Injury team could raise the level of the trauma if deemed necessary.

Data was prospectively acquired utilizing the Electronic Medical Record at Waterbury Hospital, CT for all head trauma activations from its inception in June 2017 to August 2017. Data collected included time from arrival to CT scan, outcomes, missed injuries and disposition (admission vs discharge). The number of activations that required escalation of care was also recorded.

**Results:** Since its establishment in June 2017, 50 head activations have taken place. Average door-to-CT scan was 24.8 minutes with 8 patients failing to make it to CT scan within the 30 mi-nute window. To date, no missed injuries were identified. 22 patients required admission secondary to injuries identified. 27 patients were discharged to home from the emergency room while 1 patient required transfer to a tertiary center with oral-maxillofacial surgery capability. No activation has required escalation of care.

**Conclusion:** Head Injury Alert can be safely applied as a new level of trauma activation for elder patients that fall from standing while anticoagulated. This new level of activation can maximize patient safety while reducing cost at a Level Two Trauma Center.

**Tourniquet Use in the Prehospital Setting: Are Tourniquets Being Employed Appropriately?**

Kevin M. Duignan, MS<sup>1\*</sup> Laura C. Lamb, MD<sup>2,3</sup> Monica M. DiFiori, BS<sup>2</sup> John Quinlavin<sup>2</sup> James M. Feeney, MD, FACS<sup>1,3</sup>  
 1. *Frank H. Netter MD School of Medicine at Quinnipiac University*  
 2. *Saint Francis Hospital and Medical Center*  
 3. *University of Connecticut School of Medicine*

**Introduction:** In the wake of recent domestic mass casualty events as well as continually emerging military research, the analysis of severe extremity injury management has surged, with an emphasis on tourniquets. One of the groups that formed to address civilian mass casualty incident responses was the Hartford Consensus, which called for greater coordination between first responders and Emergency Medical Services (EMS), and increased use of tourniquets for extremity hemorrhage management. Since then, there has been a nationwide increase in tourniquet applications. Without proper training, however, tourniquets can be inappropriately used which can lead to negative patient outcomes. We sought to evaluate tourniquet application practices in the prehospital setting in the Hartford metropolitan area.

**Methods:** We gathered data on patients admitted between April 2014 and January 2017 with an extremity Abbreviated Injury Score (AIS) of 4 or greater who had an injury to an extremity. We then identified a small group of patients with these inclusion criteria who received tourniquets during prehospital transportation. Within this group we compared age, gender, race, injury mechanism, first responder involvement, ambulance service, Injury Severity Score (ISS), Mangled Extremity Score (MESS), admission Glasgow Coma Scale (GCS), operative interventions, discharge destinations, and mortality rates. Based on these

factors, as well as EMS notes, Emergency Department notes, and operative notes, we evaluated the appropriateness of each tourniquet application, and identified another group of patients who should have received a tourniquet during prehospital transportation but did not.

**Results:** One hundred sixteen patients met our initial screening criteria. Of these, we identified three patients who received tourniquets. Based on the collection of patient information available, we determined that all three of these tourniquet interventions were inappropriate and not indicated. Additionally, we identified five patients who did not receive a tourniquet when one was indicated.

**Conclusion:** There remains a disconnect between tourniquet application protocols and the practice of appropriate tourniquet use in the prehospital setting, suggesting the need for uniform training and a widespread, standardized tourniquet protocol.

#### **Fall In The Graduated Geriatric Patient: Predicting Acute Traumatic Findings On Computed Tomography Scanning Of The Head**

JL Hubbard\*, J Kakuturu\*, P Corvo\*, J Alexander Palesty\*, A Zarif\*;

\*Saint Mary's Hospital

**Introduction:** Fall in the geriatric patient, defined as age 65 years or older, has been well studied. Height of fall, glasgow coma scale (GCS) at time of evaluation for fall, and anticoagulation use prior to evaluation for fall are all risk factors for acute traumatic findings on computed tomography (CT) head after fall in the geriatric population. However, the average life expectancy is rapidly rising. Hence, these studies may be bias as they are not isolating out an emerging subset of this population, those living past the average life expectancy. This study examines in isolation those exceeding the average life expectancy to see if the same risk factors for acute traumatic findings on CT head apply. These individuals are coined by the author as the graduated geriatric patient(s) (GGP) and are defined as those of age 81 years or older.

**Methods:** Using the Trauma Registry of a community hospital in Connecticut, we included all patients seen by the trauma team for fall from July 2012- December 2016. This included a total of 2,681 individuals. Exclusion criteria included those who were 80 years of age or younger and those who did not have a CT scan of the head. Two hundred and eighty four patients met the inclusion criteria. The variables (1) Height of fall, (2) GCS at time of presentation, and (3) Use of anticoagulation were reviewed in GGP patients who fell and the variables were compared against CT scan results of the head.

**Results:** GGP had an average age of 88 years with a range of 81 to 101 years of age. Thirty one percent of the patients were male and 69 percent were female. In terms of height, for those who fell less than 3 feet, 63% had a negative CT head and 37% had a positive CT head. For those who fell 3-15 feet, 44% had a negative CT head and 56% had a positive CT head. For those who fell more than 15 feet, 0% had a negative CT head and 100% had a positive CT head (p-value 0.008). A GCS of 8 or less noted a negative CT scan

in 43% of cases and a positive CT scan in 57% of cases. A GCS of 9-12 noted a negative CT scan in 50% of cases and a positive CT scan in 50% of cases. For a GCS of 13-15, 60% of patients has a negative CT scan and 40% of cases had a positive CT head (p-value 0.542). For those not on aspirin, 62% had a negative CT head and 38% had a positive CT head. For those on aspirin, 57% had a negative CT head and 43% had a positive CT head (p-value 0.242). For those not on anticoagulation, 62% had a negative CT head and 38% had a positive CT head. For those on anticoagulation, 56% had a negative CT head and 44% had a positive CT head (p-value 0.235)

**Discussion:** The GGP sees increased risk of positive CT head for acute traumatic findings as the height of fall increases. This was statistically significant and consistent with known data on falls in the geriatric population. Unlike known data in the geriatric population, the GGP did not show a statistically significant correlation of GCS and positive CT head findings. This population may have a lower GCS at baseline or may not have the same neuronal-pathophysiological response to trauma as their younger geriatric counterpart. Unlike known data in the geriatric population, the GGP showed no statistical significance in terms of aspirin or anticoagulation use and positive CT head findings. It may be that the prescription of these medications and the pharmacokinetics of these medications differs in the GGP versus their younger geriatric counterpart.

**Summary:** As the average life expectancy is rapidly increasing a new population of individuals exist, the graduated geriatric population (GGP). This author believes they are a unique subset of the geriatric population that should be studied in isolation when analyzing traumatic data. This study shows they do not adhere to the same risk factors as the geriatric population in terms of positive traumatic CT head findings after falls.

#### **Potential Adverse Events as the Result of Emergent Application of Upper Extremity Tourniquets: A Rationale for Education about Proper Indications and Techniques to Control Vascular Injury**

Lance DeRoss MD, Usman Siddiqui MD, Ahmed Mansour MS, Nicholas Mello, Alan Babigian MD  
University of Connecticut

**Introduction:** After a traumatic event some of the most obvious signs of injury include deformities and uncontrolled hemorrhage. There have been many techniques and devices that have been used for hemostasis with no clear guideline as to which is the most effective. With the surge in modern warfare and recent occurrences of domestic mass casualty events, the use of tourniquets has become more prevalent. There has been a significant amount of research directed towards the efficacy of tourniquet use in warfare, but the indication for application of tourniquets in the civilian population is less clear. As the use of tourniquets becomes more common in the prehospital setting we are seeing an increase in the number of adverse events.

**Methods:** In this case series we present three incidences of upper extremity trauma managed with tourniquets that led to an adverse event. A literature search and review was

conducted to summarize the use of proper tourniquet application and the potential complications of tourniquets when not used appropriately.

**Results:** Three cases of upper extremity trauma that resulted in arterial injury, and initially managed with a tourniquet at a major tertiary care facility with a Level 1 Trauma Center designation during 2017. In all three cases direct pressure or other forms of pressure dressings were not attempted for hemostasis. The first case involved the use of a blood pressure cuff as a tourniquet for 127 minutes, resulting in venous congestion. In the second case a belt tourniquet was used for a forearm injury. The tourniquet was left in place for 120 minutes and resulted in compartment syndrome. The third case was that of a patient with multiple forearm lacerations managed with a constrictive-band type tourniquet. The tourniquet was in place for 196 minutes and led to neurapraxia. All three cases required operative exploration and repair of the acute injuries.

**Conclusion:** Direct pressure and pressure dressings remain the most common and effective ways of preventing extremity hemorrhage. In our experience, even though tourniquets play a role in control of massive hemorrhage, inappropriate applications can lead to significant life and limb threatening consequences. There should be education amongst the prehospital and emergency room personnel to emphasize that tourniquets are not considered a first-line therapy for hemorrhage control. Further investigation regarding the positive and negative effects of direct pressure versus tourniquet use should be undertaken.

## **General Surgery 1 Competition**

### **Moderator:**

Adrian Maung, MD, FACS, FCCM  
Associate Professor of Surgery  
Yale School of Medicine. New Haven, CT

### **Judge:**

Denise Barajas, MD FACS  
Medical Director - Hewitt Center for Breast Wellness  
Griffin Hospital, Derby CT

### A Case of Fecalith Obstruction Formed at the Site of a Small Bowel Anastomosis

Michael Allen Smith MS Rafal Barczak MD and Aziz Benbrahim MD, FACS, FASMBs  
Midstate Hospital

Patient was an 82 y.o male with a PMH of dementia, diabetes mellitus, hypertension and a previous history of bowel obstruction treated with bowel resection and the formation of an anastomosis seven years prior. Patient reported to the ED on the evening of June 21, 2017 complaining of 5 hours of intense abdominal pain, nausea and one episode of coffee-ground emesis following 2 weeks of diarrhea, dark stools and progressive abdominal distention. He was a former smoker but denied any alcohol or drug use. The onset of diarrhea, dark stools, and abdominal distention began 4 days after completing treatment for bilateral pneumonia which consisted of Z-pack and Augmentin antibiotic therapy. He denied any fevers, chills, chest pain, and shortness of breath. At presentation, his blood pressure was 128/70 mmHg, his heart rate was 83, his respiratory rate was 18, his temperature was 98.3 F (36.8 C), and SpO<sub>2</sub>: was 95% on room air. He was alert and oriented. Neurological examination did not show any abnormal findings. Abdominal exam was pertinent for noticeable distention without any ecchymosis and tympanic noises with percussion. There was mild abdominal tenderness to palpation but no rebound tenderness, CVA tenderness or guarding. The rest of physical exam was unremarkable. An abdominal x-ray showed dilated loops of bowel extending from approximately 2 feet proximal to the ileocecal valve-suggesting a small bowel obstruction at that area. Abdominal CT showed a large, hollow structure in the distal ileum that was consistent with an intussusception or a mass obstruction. An accumulation of fecal material was shown proximal to the mass (see fig 1.) Decreased contrast follow through the superior mesenteric artery and edematous bowels suggested ischemia. Upon seeing these imaging results, an NG tube was placed and he was placed on aggressive IV fluids. The patient was scheduled for emergency laparotomy to resect any dead bowel and possibly place a stent in the SMA. Incision was made across the linea alba from the xyphoid process, just to the right of, around, and past the umbilicus and stopping

Figure 1: Abdominal CT reveals fecal impaction proximal to a hollow mass (blue arrow) approximately two feet proximal to the IC valve. A sudden decrease in contrast at the SMA (red arrow) was also cause for concern.



approximately 2 cm below the umbilicus. Upon opening the abdominal cavity, no abdominal adhesions were observed. The bowels showed no signs of ischemia or necrosis. The anastomosis from previous bowel resection was found approximately 2 feet proximal to the ileocecal valve. The anastomosis appeared well-perfused but was dilated like

much of the rest of the bowel. The surgeons were able to palpate a large, movable mass just distal to the anastomosis in the intestinal lumen. They proceeded to open the bowel and remove the mass which was free moving. Mass was hard, approximately 5 cm in diameter and took on a yellow-green color. Doppler ultrasound showed strong vascular signals at the SMA and the distal branches of the vasculature of the small bowel. Therefore, it was decided to not pursue any stent placement out of fear of doing additional harm to the patient. The original anastomosis was resected, removing approximately 2 feet of bowel in total. Examination of other abdominal organs was unremarkable. The gallbladder showed no evidence of cholecystitis or cholelithiasis. The incision was then closed and the patient was successfully aroused from anesthesia. He became confused and disoriented following surgery and remained as such for several days. Pathological analysis determined that the mass was comprised of compacted fecal material and not of bile acids which would have been consistent with gallstone ileus.

**Analysis:** Small bowel obstructions are primarily due to adhesions, hernias, or neoplasms- often following previous abdominal surgeries. Mobile blockages are uncommon in the small bowel as compared to the large bowel. When large mobile masses are present in the distal small bowel, they are likely of two etiologies: fecalith or gallstone ileus. Gallstone ileus is comparatively common, but stones of size greater than 2.5 cm require the formation of a fistula between the gall bladder and the small bowel in order to pass into the small bowel. The absence of any such fistula strongly suggests that the obstructing mass was a fecalith. This was confirmed by pathological analysis. This fecalith was found at the site of the previous anastomosis. We hypothesized that the physical structure of the anastomosis likely played a role in the formation of the fecalith- perhaps by creating a pocket in which fecal material could accumulate. To test this hypothesis, we explored other medical literature reports of fecalith SBOs presenting at a site of anastomosis. Fecaliths are previously known to obstruct the appendix or a diverticulum, often leading to appendicitis and diverticulosis respectively but only a few case studies have previously described fecalith SBOs. In previously documented cases, SBOs presented either in small children or in adults who had diabetes or significant physical disability. Fecalith formation in the small bowel is rare. Presently, there are not enough documented cases of fecalith SBOs to say definitively why the patient in this case presented with an SBO due to a fecalith. However, given the a priori basis by which an anastomosis could promote the formation of a fecalith, and how a fecalith could potentially obstruct the bowel at that site, it is surprising that this outcome is not reported more frequently. Since recurrent SBOs already often result from adhesions from previous abdominal surgeries, it is possible to see how SBOs due to fecaliths formed at previous anastomosis sites can be overlooked. However, the epidemiological impact of this mechanism of SBO formation should be better researched and documented. Gastrointestinal surgeons should be willing to monitor and document this perhaps under-reported association when it presents.

## References

- Clavien, PA, Richon, J, Burgan, S, et al. Gallstone ileus. *Br J Surg* 1990;77:737-742.
- Hayee, Buhussan et al. "A Case of Enterolith Small Bowel Obstruction and Jejunal Diverticulosis." *World Journal of Gastroenterology: WJG* 9.4 (2003): 883-884. *PMC*. Web. 26 June 2017.
- Longo, DL; Fauci, AS; Kasper, DL; Hauser, SL; Jameson, JL; Loscalzo, J (2015). *Harrison's Principles of Internal Medicine* (19 ed.). New York: McGraw-Hill. pp. 2081-2082. ISBN 978-0-07-180216-1.
- Nigar, Sofia et al. "Giant Fecalith Causing Near Intestinal Obstruction and Rectal Ischemia." *Case Reports in Gastroenterology* 11.1 (2017): 59-63. *PMC*. Web. 26 June 2017.
- Yoo HY, Park HW, Chang S-H, Bae SH. Ileal Fecaloma Presenting with Small Bowel Obstruction. *Pediatric Gastroenterology, Hepatology & Nutrition*. 2015;18(3):193-196. doi:10.5223/pghn.2015.18.3.193.

### Embolization of Intercostal Artery Pseudoaneurysm In A Patient With A Mediastinal Mass

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Saint Mary's Hospital

**Introduction:** The formation of a pseudoaneurysm (i.e. false aneurysm) within an intercostal artery is a very rare phenomenon, with only a handful of reported cases. Recently published instances have described this condition as either a complication of trauma or as a result of corrosive acid poisoning. A pseudoaneurysm is formed when a partial defect arises in the wall of a blood vessel, resulting in an aneurysmal sac that has involves the muscularis propria and adventitia. This false aneurysm lumen has direct communication with the vessel lumen. Since the wall of a pseudoaneurysm is composed of only the inner layer elastic intima it is at an increased risk of rupture when compared to a true aneurysm, which involves all 3 layers of the vessel wall, of similar size. Pseudoaneurysms can be found in the femoral artery, AV fistulas, and the aorta, but rarely do they arise in intercostal arteries. Here we present a case of a patient with a known mediastinal mass, who was incidentally found to have an intercostal artery pseudoaneurysm on CTA, and underwent multiple coil embolizations.

**Case Report:** A 67 year-old male presented to our facility after suffering from an un-witnessed mechanical fall. Patient complained of transient aphasia and hoarseness, and was found to have suffered from frontal sinus and orbital fractures, as well as injury to the left side of his neck. He had been treated at this facility 3 years prior for a 3 cm mediastinal mass, which he underwent biopsy via VATS for. The pathology demonstrated degenerative material with fibrous tissue; hemosiderin laden macrophages suggestive of old hematoma, with no evidence of malignancy. Patient underwent CTA of the neck on day 1 of his most recent admission, which demonstrated evolution of the original lesion accompanied by a larger area of contrast enhancement, consistent with a progressing pseudoaneurysm. Subsequent angiography on day 10 of hospitalization revealed a small pseudoaneurysm arising from the left intercostal bronchial trunk bifurcation, which was consequently coil embolized, along with the main feeding vessel. Follow-up CTA on day 11 demonstrated the coils posteriorly adjacent to the left fourth rib with persistent flow from a defect in the anterior wall of the

proximal descending aorta into the growing mediastinal pseudoaneurysm. The pseudoaneurysm lumen then underwent successful percutaneous transthoracic coil embolization on day 16. Of note during his hospitalization, patient also developed acute hypoxic respiratory failure secondary to PNA, acute on chronic CHF, uncontrolled AFib with RVR, and a C. Diff infection.

**Discussion:** A pseudoaneurysm arising from an intercostal artery is very rare in its own right, but one with a feeding branch from the anterior aspect of the proximal thoracic aorta is highly irregular. As described earlier, pseudoaneurysms can be dangerous, since there have been reported instances where their rupture has resulted in fatal hemorrhage. Therefore, it is crucial to identify pseudoaneurysms early during their development, and manage them accordingly.

### Case Report: Metastatic Merkel Cell Carcinoma with Deep Groin Dissection and Small Bowel Obstruction

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**Introduction:** Merkel cell carcinoma, also known as neuroendocrine carcinoma of the skin, is a rare skin cancer form that is typically very aggressive. Merkel cell carcinoma (MCC) often involves metastasis to regional lymph nodes and local recurrence. In our case study, we present a 55-year-old male patient who was found to have approximately 3 x 3 cm left anterior mid-thigh skin lesion confirmed on pathology as MCC. As our operative planning progressed and staging involved CT scans of abdomen and pelvis, superficial and deep lymph nodes were assumed to be involved and our patient underwent a groin dissection. Following recovery from groin dissection, our patient re-presented for small bowel obstruction secondary to 3.7 cm mass in abdomen highly suspicious for metastatic tumor.

**Method:** As a part of our case study presentation, we will present the operative steps and stepwise approach to our patient. Additionally, as a rare surgery, deep lymph node dissection is not a operation surgical residents have much exposure to, making this an excellent learning and teaching experience.

**Results:** Our index operation involved a local anterior thigh mass excision, which was sent for pathology and confirmed Stage II MCC (without knowledge or scans yet). Following this point, our patient was sent for CT abdomen and pelvis revealing superficial and deep lymph node involvement. No other metastatic disease was noted at this point. We proceeded with left groin dissection and excised 6 nodes with 4 of 6 nodes positive for MCC involvement. Our patient was upstaged to Stage III at this point. Following a successful groin dissection patient was discharged home and re-presented two months following with small bowel obstruction involving 3.7 cm mass in low abdomen. Patient was treated non-operatively and was discharged to home. Intentions of patient and family are to pursue any form of further treatment at Memorial Sloan Kettering. We continue to follow his progress.

**Conclusion:** Merkel cell carcinoma is a rare and aggressive form of skin cancer that forms from neuroendocrine cells. From 1988 to 2012, almost 9400 cases of MCC were recorded in the National Cancer Database. Of those 9400, 26 percent had regional lymph node involvement without disseminated metastatic disease and five-year survival was 26 percent. [1] Recent reviews cite approximately 60 percent survival rate for all forms of MCC combined. [2] Our challenging patient with now proposed stage IV MCC has a guarded prognosis; as we continue to follow closely monitor his progress.

1. Merkel Cell Carcinoma. In: AJCC Staging Manual, Springer, New York 2010.
2. Harms KL, Healy MA, Nghiem P, et al. Analysis of Prognostic Factors from 9387 Merkel Cell Carcinoma Cases Forms the Basis for the New 8th Edition AJCC Staging System. *Ann Surg Oncol* 2016; 23:3564.

### **Diverticulitis of the Appendix: Rare but Real**

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**Introduction:** Diverticulosis of the appendix is a very rare entity that clinically presents similar to acute or chronic appendicitis. Diagnosis is almost always made at the time of appendectomy or on pathology. Treatment of appendiceal diverticulitis is the same as appendicitis, however, it may be associated with an increased risk of appendiceal neoplasms.

**Presentation of Case:** We present the case of a healthy 30 year old female admitted with a two day history of abdominal pain. The pain gradually shifted to the right lower quadrant, with no other associated symptoms. Her physical exam was typical for acute appendicitis; she had tenderness at the McBurney's point, with rebound, and focal guarding. No leukocytosis was seen on laboratory evaluation, however she had an enlarged appendix with peri-appendiceal fat stranding on abdominal imaging consistent with early acute appendicitis. She underwent a Laparoscopic Appendectomy; the tip of her appendix was enlarged and inflamed while the base was found to be mildly hyperemic. The patient had an uneventful recovery and was discharged the day after surgery. Upon histologic evaluation, her appendix had Goblet cell hyperplasia and two large diverticuli over the distal appendix with polymorphonuclear infiltration suggestive of acute appendiceal diverticulitis. No occult neoplasm was demonstrated.

**Discussion:** Appendiceal diverticulitis is mainly diagnosed during surgery or on pathology, but rarely on preoperative imaging. While it clinically mimics acute appendicitis, it is associated with an increased incidence of appendiceal neoplasms and a higher risk of perforation. If found incidentally appendiceal diverticula should be treated aggressively with prophylactic appendectomy.

### **Effect of Enhanced Recovery After Surgery Including Transversus Abdominus Plane Block on Hospital Length of Stay and Narcotic Use in Patients Undergoing Complex Ventral Hernia Repair**

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*St. Francis Hospital*

**Introduction:** Enhanced Recovery After Surgery (ERAS) pathways have been shown to expedite discharges and lower the rate of non-surgical complications in certain surgical populations. We implemented an ERAS pathway for patients undergoing complex ventral hernia repairs, including a transversus abdominus plane (TAP) block using Exparel to determine if streamlining patient care would result in shorter length of stays and lower narcotic requirements compared to patients in the pre-ERAS period.

**Methods:** An ERAS pathway was implemented for patients undergoing complex ventral hernia repairs (transversus abdominus release, posterior rectus sheath release, and endoscopic component separation) beginning in July 2016. Prior to the procedure, patients received a TAP block using a combination of Exparel and bupivacaine. Post-operatively, patients were given standardized orders including a multi-faceted pain regimen composed of mainly non-narcotic analgesics. Early ambulation and rapid diet advancement were also emphasized. Length of stay (LOS), hours requiring patient controlled analgesia (PCA), and morphine equivalents used per day of hospital stay were compared for patients in the pre-and post-ERAS time periods.

**Results:** A total of 52 patients were analyzed for this study, 32 of which underwent repair after ERAS implementation. Compared to the pre-ERAS population, post-ERAS patients were similar in terms of age (mean age 61.1 for post-ERAS vs. 60.1 for pre-ERAS), gender makeup (81% vs. 80% female), and BMI (32.1 vs 32.6 all p values >0.05). Length of stay was significantly shorter in post-ERAS patients (Table 1). Hours requiring PCA and morphine equivalents given per day were also significantly reduced in post-ERAS patients.

**Conclusions:** Implementation of an ERAS pathway with the inclusion of a TAP block decreased hospital stay and narcotic use for patients undergoing complex hernia repair.

**Table 1. Outcomes for Patients Undergoing Complex Ventral Hernia Repair Pre-and Post-ERAS Implementation**

	Pre-ERAS	Post-ERAS	P value
Average Length of Stay (days)	5.8	2.7	<0.01
Hours requiring PCA	102.3	6.2	<0.01
Morphine equivalents/day in hospital	13.1	19.4	<0.01

### **Abdominal Cocoon Presenting as Bowel Infarction**

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*Stamford Hospital*

**Introduction:** Encapsulating Sclerosing Peritonitis (ESP) is a very rare form of peritoneal inflammation that involves both the parietal and visceral peritoneal lining of the abdomen. It often presents as a thickened fibrous rind of peritoneum that can encapsulate the small bowel and lead to intestinal obstruction. Initially described in the early 1900's, it was termed "abdominal cocoon". The etiology of ESP is generally unknown and possibly multifactorial. Some major risk factors include peritoneal dialysis, liver cirrhosis,

solid organ transplant, medications, abdominal tuberculosis, and prior abdominal surgery. Surgical management with excision of the fibrous membrane and lysis of adhesions is the preferred treatment, however this condition is often a diagnostic dilemma.

**Case:** A 60 year old male with history of diabetes mellitus, end stage renal disease on dialysis, hepatitis C and cirrhosis who presents with recurrent severe intestinal obstruction and progressive peritonitis. Intra-operatively the majority of his small bowel and some ascending colon were encapsulated in a thick fibrous peritoneal membrane. After excising this peritoneal envelope a substantial amount of the small bowel was found to be infarcted. Despite multiple trips to the operating room he developed progressive septic shock and multiple organ failure and he eventually elected to be made comfort measures only.

The majority of patients with ESP present with acute or chronic symptoms of bowel obstruction. The obstruction is likely due to secondary compression and kinking of the bowel within the thick fibrous peritoneal membrane. ESP may often pose a diagnostic dilemma and should be included in the differential diagnosis of unclear or unexplained bowel obstruction and malnutrition, especially in patients with a history of peritoneal dialysis and solid organ transplantation.

In summary, ESP is a very rare but serious condition. It has been linked with peritoneal dialysis and solid organ transplant and may potentially present as late sequela. Abdominal X-ray findings are usually nonspecific. Contrast enhanced CT (A) can be very useful in preoperative workup however the imaging features are not pathognomonic. The absolute diagnosis of ESP is intra-operative and made in conjunction with histopathologic findings. Timely diagnosis and management is paramount in mitigating morbidity and avoiding mortality.



### **Abdominal Necrotizing Fasciitis Masquerading as Cushing's Disease: A Surgeon's Fierce Enemy!**

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<sup>1</sup>University of Connecticut School of Medicine, <sup>2</sup>The Hospital of Central Connecticut

**Introduction:** Cushing's syndrome is a rare endocrine disorder characterized by excess production of glucocorticoids resulting in characteristic cushingoid features and sequelae of hypercortisolism such as immunosuppression and impaired wound healing. Elevated serum glucocorticoid level is either the result of excess ACTH secretion (e.g. pituitary adenoma or small cell lung

cancer) or enhanced adrenal cortisol production (adrenal tumors or hyperplasia). Diagnosing and treating Cushing's syndrome is imperative to preventing complications and reducing the mortality and morbidity of the patient.

**Case Description:** We present the case of a 26-year-old female with morbid obesity and poorly controlled diabetes, admitted with a necrotizing soft tissue infection of the lower anterior abdominal wall. She underwent wide excisional debridement with a resultant large soft tissue defect, which extended over bilateral groins and occupied over 50% of her lower abdominal wall. Despite aggressive wound care, the patient had lack of adequate granulation and delayed wound healing. Due to her cushingoid features (moon facies, fat deposit on posterior neck, truncal obesity, skeletal muscle wasting, hirsutism, acne, purplish truncal striae) endocrine workup was conducted revealing hypercortisolism with a pituitary macroadenoma on brain MRI. Inferior petrosal sinus sampling showed significant central-to-peripheral gradient confirming pituitary origin. Patient underwent trans-sphenoidal endoscopic tumor resection and pathology confirmed corticotroph adenoma. Postoperatively, patient's glycemic control improved dramatically and her rate of wound healing and granulation improved.

**Conclusion:** Cushing's syndrome is a rare disease and could be challenging to diagnose. Elevated serum glucocorticoid levels may have remarkable immunosuppressive effects, predisposing to infectious complications and impaired wound healing. High clinical suspicion and appropriate workup is imperative to timely diagnosis and treatment in surgical patients to prevent complications and reduce morbidity and mortality.

### **Mosquito Netting As A Low Cost Alternative To Hernia Mesh In Liberia**

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<sup>2</sup> Department of Surgery, JFK Hospital Monrovia Liberia

**Learning Objectives:** Recognize the need for low cost solutions in a resource limited environment. Demonstrate practical, tested methods for hernia repair that are both low cost and effective. Treat inguinal hernias in a resource limited environment utilizing the above learning objectives.

**Case:** Over the last several years we have made 15 trips to JFK hospital in Monrovia, Liberia to provide surgical care to the general population and surgical education to the physicians and residents. Recently, we have implemented the use of sterilized mosquito netting in our inguinal hernia repairs as a low cost mesh alternative. To date we have performed a total of 6 repairs using the mosquito netting. We have found the material to be both easy to use and a much less costly, more sustainable alternative to traditionally available commercial hernia mesh. To date we have not had any reoccurrences or mesh infections.

**Discussion:** Inguinal hernia repair is one of the most frequently performed surgical procedures worldwide. While the data for Liberia is lacking, in nearby Ghana, the

estimated incidence of inguinal hernias is 7.7% in the adult male population. These hernias are typically much larger than those encountered in Western countries. Compared with open elective tissue-based repairs, mesh repair is associated with fewer recurrences and with shorter hospital stay and faster return to usual activities.

The use of mesh in developing nations is very limited secondary to availability and cost. Typically commercial mesh costs greater than \$125. Compared to this, a similar sized piece of mosquito net costs less than \$1. In 2016, Löfgren et al. published a randomized trial demonstrating no significant difference in rates of hernia recurrence and postoperative complications among men undergoing hernia repair with mosquito net versus those undergoing hernia repair with commercial mesh.

Through the introduction of this technique, we hope to improve access to mesh repairs in Monrovia, Liberia through increased exposure and education, as well as eliminating the prohibitive costs of a traditional commercial mesh.

Despite its popularity in Western countries, hernia repair with mesh continues to be a rare occurrence in developing nations secondary to its prohibitive cost and lack of availability. Because of this, inguinal hernias in these countries tend to present larger and more symptomatic, with very high recurrence rates after primary repair. Sterilized mosquito net presents as a viable and cost effective alternative for the repair of inguinal hernias in countries where commercial mesh is not readily available.



## **General Surgery 2 Competition**

### **Moderator:**

Royd Fukumoto, MD, FACS  
Department of General Surgery Program Director,  
General Surgery Residency Program  
Danbury Hospital, Danbury, CT

### **Judge:**

Kathleen LaVorgna, MD, FACS  
Chair of Surgery, Norwalk Hospital, Norwalk, CT

### **Laparoscopic Repair of a Perforated Duodenal Ulcer with a Falciform Ligament Pedicle Flap: A Case Report**

Aziz Benbrahim MD, FACS, FASMB, Kristen Errico BS  
Midstate Medical Center and Quinnipiac University Frank H. Netter MD School of Medicine

**Introduction:** There are a variety of surgical techniques to repair a perforated peptic ulcer. The approach is dependent on the condition of the patient, the characteristics of the perforation, and the experience of the surgeon. Here we present the use of the falciform ligament as a pedicle flap secured with barbed sutures as a valuable option especially during the laparoscopic approach. This technique preserves the ability to maintain a minimally invasive approach in patients with a friable omentum that is difficult to mobilize in the popular repair with an omental patch, also known as a Graham patch. The technique described here further simplifies the laparoscopic approach through the use of barbed sutures as it eliminates the need to tie knots. To our knowledge, this is the first case report of the use of the falciform ligament pedicle flap in a laparoscopic approach with the use of barbed sutures.

**Case Presentation:** A 53 year old female smoker with a past medical history of peptic ulcer disease presented to the emergency department with a two week history of mild epigastric abdominal pain that suddenly became diffuse and severe over the last day. On exam, the patient was hypotensive with abdominal distention and guarding. A CT scan of the abdomen demonstrated free air and ascites. The patient was emergently taken to the operating room for laparoscopic exploration, which revealed ascites, peritonitis with fibrinous deposits throughout all four quadrants, and a perforated anterior duodenal ulcer, which was 5mm in size. The perforation was plicated with an absorbable barbed suture. The same suture was used to secure the mobilized falciform ligament over the repair without tension. The patient tolerated the procedure and was discharged three days later.

**Conclusions:** This case report demonstrates the value of the falciform ligament pedicle flap as an alternative to the more commonly utilized omental patch, especially during a laparoscopic approach. Even during an open approach, the omentum may be difficult to mobilize due to previous surgeries or inflammation, or the patient may simply lack sufficient omentum. The proximity of the falciform ligament to the proximal duodenum may be more easily appreciated laparoscopically compared to an open approach. Additionally, an open approach lends itself to mobilization of the omentum, which may be more challenging laparoscopically. The use of barbed sutures eliminates the need to tie knots, further contributing to the efficiency of this procedure. In conclusion, the falciform ligament pedicle flap is a valuable alternative to the omental patch for the repair of perforated peptic ulcers. It enables simpler repair and greater predictability during a laparoscopic approach compared to the omental patch.

### **Is Robotic Assisted Laparoscopic Inguinal Hernia Repair Superior To Open Repair?**

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Stamford Hospital, Stamford CT

**Introduction:** The inguinal hernia repair has seen several critical improvements in recent times due to the implementation of new techniques, including laparoscopic repair, as well as robotic repair. With over 600,000 inguinal hernia repairs performed annually, it is important to identify the safest and most patient-friendly method. For surgeons, robotic assisted laparoscopic surgery is gaining in popularity for its dexterity and 3D visualization. But despite the growing interest in robotic hernia repairs, there is a scarcity of literature to support its superiority over open inguinal hernia repair. This study hypothesizes that patients who undergo robot assisted laparoscopic inguinal hernia repair will have decreased immediate post-operative pain, shorter recovery room stays, decreased narcotic requirement, and overall decreased pain at follow up compared to open inguinal hernia repair.

**Methods:** In this study, we performed a retrospective analysis of patients who underwent either an open or robotic assisted laparoscopic inguinal hernia repair at Stamford Hospital, from July 2015-July 2017. The following characteristics were analyzed for both subsets of patients: gender, BMI, type of repair, operative time, recovery room time, immediate post-operative pain, and post-operative pain at follow up. A standardized pain scale was used to assess post-operative pain levels for each subset. Narcotic usage was assessed based on morphine level equivalent units.

**Results:** Our study demonstrated longer average operative time for patients undergoing robotic hernia repair (102 minutes) compared to open repair (59.2 minutes), which was statistically significant ( $p$  value =  $<0.05$ ). Patients who underwent robotic inguinal hernia repair spent less time in the recovery room (74.7 minutes) compared to patient who underwent open repair (83 minutes). Pain measured at 3 hours post-operation was less in the robotic repair group (average pain scale=2.1) compared to the open repair group (3.28), which was statistically significant ( $p$  value =  $<0.05$ ). In addition, patients in the robotic hernia group required less narcotics in the recovery room compared to patients who underwent open repair ( $p$  value =  $<0.05$ ). There was no statistically significant difference between lengths of hospital stay between the two groups.

**Conclusions:** This study highlights several possible advantages of robotic inguinal hernia repair, including lower post-operative pain scores, less narcotic usage required in the post-operative period, as well as shorter recovery room time. The results from this study should increase interest in investigating the superiority of robotic inguinal hernia repair. Future plans for study involve comparing robotic to laparoscopic repair. In addition, we plan to continue to follow the study patients to look at additional qualitative metrics, including time to return to work and time to return to daily activities.

**Resources:** Comparison of robotic versus laparoscopic transabdominal preperitoneal TAPP inguinal hernia repair

### Metastatic Penile Cancer- A Lesser Known Evil: A Case Report from a Community Cancer Program

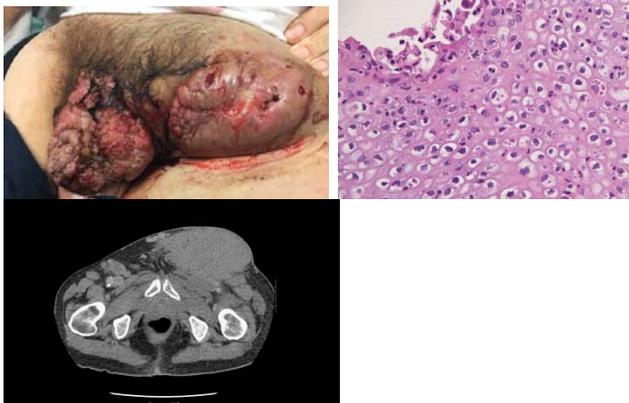
Santosh Swaminathan MD, Jahnvi Kakuturu MD,  
Alexander J. Palesty MD FACS  
Saint Mary's Hospital

**Introduction:** Penile cancer is a rare disease in the Western Hemisphere accounting only for 0.4%-0.6% of the neoplasms in men in the USA and Europe. The number of cases every year are so few that there are no randomized controlled trials to determine the guidelines for management and is usually based on expert recommendations.

**Methods:** A 46 year old self-employed uninsured monogamous man presented with a large left inguinal swelling and an ulcerative growth on the penis. He first noticed warty projections 15 years prior to presentation and these progressed to replace the entire penile shaft. The surgery team was initially consulted by the ED for a possible large inguinal abscess.

**Results:** CT scan of the abdomen revealed bilateral inguinal lymphadenopathy, predominantly left sided with pelvic lymphadenopathy. CT scan of the chest revealed a single pulmonary nodule in the right lung apex with a questionable T6 lesion. Core biopsies of bilateral inguinal region swellings were identified as metastatic squamous cell carcinoma. The presence of suppurative inguinal lymph nodes and an open wound post incision and drainage precluded him from receiving chemotherapy, which is the standard of care for metastatic penile cancer. Hence he was planned to receive palliative radiation therapy.

**Discussion:** Early identification of suspicious penile lesions is important as the 5-year survival rates for penile cancer can be as low as 50%. The social stigma associated with genital lesions often leads to a delay in diagnosis. Awareness of community physicians towards suspicious penile lesions is imperative for successful management and improved survival.



### Invasive Ductal Carcinoma Discovered On Excisional Biopsy Within An Intramammary Lymph Node: Rare Finding, Worse Prognosis

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**Introduction:** In patients with breast cancer, metastases to intramammary lymph nodes with axillary lymph node negative disease is uncommon and moreover is an independent predictor of poor outcome.

A 51 year-old asymptomatic post-menopausal African-American female presented to the office with newly diagnosed screen detected right breast cancer. Her family history is significant for breast cancer in her maternal aunt, diagnosed at 43 years of age. She is a non-smoker and uses alcohol socially. She used birth control for 29 years, started menopause at 50 years old, and started preventative breast ultrasound screening at that time. She has had 5 pregnancies, 4 live births and age at first pregnancy was 21 years old. On physical exam, her breasts were symmetrical and there were no skin changes. Both nipples were everted with no discharge or retraction. Palpation of the right breast showed at 10:00, about 4 cm from the nipple, a 2 cm mass that was non-tender and mobile from the chest wall with no overlying skin changes.

Yearly screening mammogram revealed a suspicious 9mm right breast mass at 10:00, 4cm from the nipple. Ultrasound-guided right breast core needle biopsy revealed a portion of a lymph node with metastatic moderately differentiated adenocarcinoma that was ER positive, PR and Her2Neu negative. Due to the density of her breasts, the patient underwent bilateral MRI, which identified several additional suspicious lesions in bilateral breasts. All lesions were biopsied and were negative for malignancy.

The patient elected to have breast conserving wire-localized partial mastectomy with sentinel lymph node biopsy and post operative radiation. Three sentinel nodes were excised intra-operatively and all were negative for malignancy. The mass on final pathology revealed a 0.3 cm foci of invasive ductal carcinoma, notably involving an intra-mammary node. The carcinoma was moderately differentiated, nuclear grade 2, without extra-nodal extension, and was excised with negative margins. Final pathologic staging was pTisN1aMx, classified as stage IIa. The tumor was considered Tis as one of the prior MRI-guided core needle biopsies from the right breast was re-evaluated and found to be consistent with DCIS. There was no evidence of distant metastasis on bone scan or CT chest, abdomen, pelvis. The tumor was confirmed to be ER positive (90%), PR negative, and Her-2Neu negative, with a Ki-67 of 20%.

Post operatively, the patient began an adjuvant chemotherapy regimen (methotrexate, fluorouracil and cytoxan), and will be going for radiation therapy. She will return for her next clinical exam in six months, and will have a mammogram and breast US in one year from her previous screening exam.

**Conclusions:** Breast cancer metastases to intramammary lymph nodes with axillary node negative disease, is a rare finding and confers a worse prognosis for patients. It is critical that providers ensure a proper pre-operative workup including comprehensive imaging as involvement

of these nodes upgrades the cancer stage and alters management.

**Firefly –Flip a Switch to See the Ureter  
Use of Indocyanine Green for Localization and Preservation  
of Ureters in Robotic-Assisted Colon Surgery**

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**Introduction:** Identification and preservation of ureter is a technical challenge during colon and pelvic surgery. The use of fluorescent dye has recently been included as an adjunct to enable easy intra-operative identification and hence preservation of the ureter during robotic-assisted surgery.

**Aim:** We want to study the feasibility and utility of Firefly Fluorescence Endoscope system during robotic-assisted colon resections.

**Methods:** We retrospectively reviewed cases in which Firefly technology was used by our surgeons in the time period Jan 2016 to April 2017. Our technique included a urologist to perform an on-table cystogram with the placement of bilateral ureteric stents and instillation of 5 cc of ICG (Indocyanine green) to each ureteric orifice under direct vision. The stents were left in place during the procedure and removed at the end of the procedure. While the robot removes tactile sensation it allows for the use of near-infrared laser that helps the ICG fluoresce as well as lens filtering, called Firefly Fluorescence Endoscope system which converts the fluorescing ICG to a bright green color. The operation was performed and Firefly mode was used as required throughout the case to visualize the ureter at the surgeon's discretion by flip of a switch on the surgeons console.

**Results:** In our institution we identified 10 cases in which using ICG and Firefly Fluorescence was used. We observed 100 % success rate in identifying and preserving ureters. The cases mainly included sigmoid resections especially in the setting of recurrent/complicated diverticulitis. No ureteric injuries were noted in this series.

**Conclusion:** The use of ICG and robotic Firefly Fluorescence technology enables easy identification of ureter during colon resections. Our early experience with this novel technique has shown that this is both easy to perform and effective in allowing visualization of the ureters especially in difficult cases where the risk of ureteral injury can be high. No side effects are noted by the use of ICG. This technology has the potential to decrease the rate of intra-operative ureteral injury in complicated colon resections and also in pelvic gynecological procedures as well. Future comparative studies should be performed to better assess whether there is true reduction in ureteric injury identification and/or prevention.

**Use of Alginate-based Substance for Repair of Tracheal Injury**

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**Introduction:** Tracheal injuries can be life-threatening, and can result from both blunt and penetrating trauma. The current standard of care for tracheal injuries not amenable to conservative management is surgical suture repair for small injuries or circumferential resection with end-to-end anastomosis for larger injuries. However, surgical management can result in undue tension at the repair site, inability to clear respiratory secretions at the suture line, dehiscence, stenosis, and associated nerve injuries. There is thus a need to investigate alternative methods of tracheal injury repair. One potential alternative is the use of alginate-based substances, which have been used successfully in external wound healing.

**Method(s):** Four wild type Sprague-Dawley rats were used for the experiment. Under general anesthesia, group A underwent a 0.2 cm laceration injury in trachea, and underwent suture repair (n=1). Group B underwent an 18-gauge needle puncture injury in the trachea, and underwent suture repair (n=1). Group C underwent a 0.2 cm laceration injury in the trachea, and underwent repair with a patch of alginate-based substance (n=1). Group D underwent an 18-gauge needle puncture injury in the trachea, and was repaired with a patch of alginate-based substance (n=1). All 4 rats were harvested at 14 days and paraffin sections were stained for H&E and Trichrome.

**Results:** All 4 rats did very well postoperatively, without any external signs of respiratory difficulty such as labored breathing. Upon harvesting on 14 days, all 4 tracheas appeared well-healed, without any gross differences at the injury sites. H&E and trichrome staining showed good regeneration at the injury sites comparing the experimental rats to an uninjured control rat trachea.

**Conclusions:** Tracheal injury can be difficult to manage intraoperatively. In this feasibility study, we have shown that alginate-based substances can be used as a comparable alternative to the standard of care suture repair method. These positive findings have prompted further study into the use of alginate-based repairs methods to prevent the complications associated with suture repair.

**Primary Repair with Suture For Common Bile Duct Injury  
During a Robotic Assisted Cholecystectomy**

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**Introduction:** Common bile duct injury during laparoscopic procedures and robotic procedures have been noted to have a comparable overall incidence of 0.08% from 2005 to 2010.<sup>1</sup> Depending on the size and location of the duct injuries, choledochotomy and hepaticojejunostomy have been noted to be utilized as common avenues for

management.<sup>3</sup> The objective is to explore primary repair with suture as option for the management of common bile duct injuries during a robotic procedure.

**Methods:** 52 year old female presented for elective cholecystectomy in with concurrent choledocolithiasis. Patient underwent a successful Endoscopic Retrograde Cholangiopancreatography preoperatively; baseline bilirubin was noted to be 8 mg/dl. During the robotic cholecystectomy, there was an event of Strasberg D common bile duct injury which was repaired primarily with suture. Representation of the completed repair can be noted in figure 1.

**Results:** After the primary repair with suture, the common bile duct injury was controlled. The patient did well post operatively with a down trend of bilirubin levels.

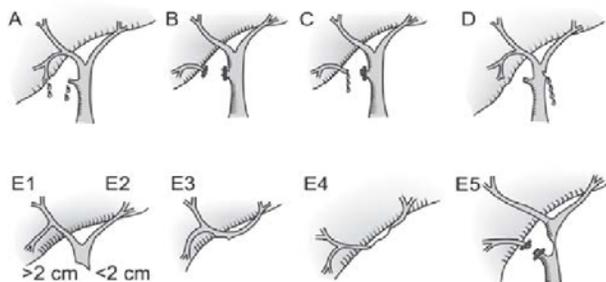
**Conclusion:** Primary repair with suture is a repair option that allows for immediate management of a common bile duct injury. This repair option requires less time when compared to a choledocotomy or a hepaticojejunostomy, and may benefit from further investigation on a larger patient population.

**Figure 1.** Robotic assisted primary repair with suture of common bile duct



**Table 1.** Strasberg-Bismuth Classification of Injuries

Type A	Cystic duct leaks or leaks from small ducts in the liver bed
Type B	Occlusion of part of the biliary tree, typically clipped and divided right hepatic ducts
Type C	Transection (but not ligation) of the aberrant right hepatic ducts
Type D	Lateral injuries to major bile ducts
Type E1	Common hepatic duct division, >2cm from bifurcation
Type E2	Common hepatic duct division, <2cm from bifurcation
Type E3	Common bile duct division at bifurcation
Type E4	Hilar stricture, involvement of confluence and loss of communication between right and left hepatic duct
Type E5	Involvement of aberrant right hepatic duct alone or with concomitant stricture of the CHD



#### References:

- 1.) [Long-term outcomes of patients with common bile duct injury following laparoscopic cholecystectomy.](#) Halbert C, Altieri MS, Yang J, Meng Z, Chen H, Talamini M, Pryor A, Parikh P, Telem Surg Endosc. 2016;30(10):4294. Epub 2016 Jan 28.
- 2.) [Robotic assisted Roux-en-Y hepaticojejunostomy in a post-cholecystectomy type E2 bile duct injury.](#) Arun Prasad, Sudipto De, Purak Mishra, and Abhishek Tiwari. World J Gastroenterol. 2015

Feb 14; 21(6): 1703–1706. Published online 2015 Feb 14.

doi: 10.3748/wjg.v21.i6.1703

- 3.) [Recent classifications of the common bile duct injury.](#) Kwangsik Chun. Korean J Hepatobiliary Pancreat Surg. 2014 Aug; 18(3): 69–72. Published online 2014 Aug 31. doi: 10.14701/kjhbps.2014.18.3.69
- 4.) <https://www.sages.org/meetings/annual-meeting/abstracts-archive/does-robotic-approach-in-cholecystectomy-increase-the-chance-of-common-bile-duct-injury-in-surgeons-early-experience-during-transition-to-practice/>

### **The Effect of Insurance Type on Access to Inguinal Hernia Repair Under the Affordable Care Act**

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**Introduction:** The expansion of Medicaid under the Affordable Care Act (ACA) extended coverage to any individual with incomes up to 138% of the federal poverty level. As of January 2017, 31 states and the District of Columbia have elected to expand Medicaid. Our study investigated the impact of the type of insurance on access to elective inguinal hernia repair and the disparities in access between expansion and non-expansion states.

**Methods:** Using the American College of Surgeons directory, 240 hernia repair surgeons across eight states (four which have expanded Medicaid [NY, CA, OH, IL] and four which have not [TX, FL, NC, GA]) were randomly selected. Investigators posed as simulated patients seeking an evaluation for an inguinal hernia and phoned selected surgeons. Physician offices were contacted using a standardized script from a caller ID-blocked phone number at three separate occasions to assess responses to three different insurance types (Blue Cross, Medicaid, Medicare). Appointment success rates and waiting periods were compared between published Medicaid and Blue Cross or Medicare scenarios.

**Results:** Of 240 surgeons contacted, 75.4% scheduled appointments for Medicaid patients, compared to 98.8% for Medicare patients and 98.3% for those with Blue Cross ( $p < 0.001$ ). In states that expanded Medicaid, fewer offices accepted Medicaid patients compared to those in non-expanded States (68.3% vs 82.5%,  $p = 0.011$ ). No differences in wait times between expanded and non-expanded states were observed. Surgeons in urban settings were less likely to accept Medicaid patients than non-urban offices (70.6% vs 82.5%,  $p = 0.036$ ) while solo practices were less likely to accept Medicaid patients than group practices (50.0% vs 79.0%,  $p < 0.001$ ). No differences in the acceptance of Medicaid patients between academic and private practice surgeons were noted ( $p = 0.516$ ).

**Conclusions:** Simulated Medicaid patients were less successful at scheduling appointments for surgical consultation than Blue Cross or Medicare patients. Despite expanded Medicaid, fewer surgeons in expansion states accepted Medicaid patients. These findings should be further investigated with future changes in Medicaid to understand impact on access to surgical care.

## **Clinical Oncology Competition**

**Moderator:**

Scott H. Kurtzman, MD, FACS  
Program Director, General Surgery Residency Program  
Chairman, Department of Surgery  
Waterbury Hospital, Waterbury, CT

**Judges:**

Connecticut Commission on Cancer

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## **Plastic and Reconstructive Surgery**

**Moderator & Judge:**

Ibrahim M. Daoud, MD, FACS  
Director, Minimally Invasive Surgery Center,  
Saint Francis Hospital and Medical Center,  
Private Practice, Connecticut Surgeons, LLC, Hartford, CT

## Clinical Oncology

### Does Cancer Stage and Type of Surgery Predict Readmission Events among Colorectal Cancer Patients?

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**Introduction:** Readmissions after colorectal cancer surgery are not uncommon and result in decreased patient satisfaction and lower reimbursement rates. Reasons for readmissions are manifold. We aim to determine if readmission rates are related to type of surgery and cancer stage.

**Methods:** A retrospective analysis of all patients undergoing colorectal cancer surgery at a single institution in central Connecticut between the years of 1999 and 2014 was performed. Characteristics of patients who underwent readmission within 30 days were compared to patients who were not readmitted. Differences in group characteristics were calculated using Stata IC, Version 14. Chi-square tests and student's t-tests were used to compare categorical and continuous variables, respectively.

**Results:** A total of 903 patients were identified who met inclusion criteria. Readmission data was available for 583 patients. Overall readmission was 10.46% (61 patients). Average age and sex distribution were similar among groups. Patients who were readmitted had a trend towards a lower average BMI (24.9 vs 28.7,  $P=0.06$ ). Distribution of clinical stage was significantly different among groups ( $P=0.02$ ). This difference was not seen after final pathologic staging ( $P=0.21$ ). Type of surgery did not affect readmission rates, with no observed differences among patients who underwent open versus minimally invasive procedure (55% vs 47%, respectively,  $P=0.53$ ) and among patients who underwent additional rectal resection compared to patients who did not (15% vs 21%, respectively,  $P=0.27$ ).

**Conclusion:** Reasons for readmissions are manifold and vary widely between individual patients. In this analysis of colorectal cancer patients, type of surgery and pathological stage did not have a significant predictive value of a readmission event. Further studies are needed to confirm the difference in clinical stage distribution and average body mass index among patients who were readmitted.

### Transmural Necrosis of the Colon in a Patient with Metastatic Non-Small Cell Lung Cancer Undergoing Bevacizumab Therapy

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**Introduction:** Vascular Endothelial Growth Factor (VEGF) is one of the key proangiogenic peptides that are overexpressed in most human cancers. Bevacizumab is a humanized monoclonal antibody against VEGF. It binds to the VEGF-A ligand and prevents VEGF from binding to its receptors. Bevacizumab has been shown to cause serious adverse events including spontaneous bowel perforation

even in patients without gastrointestinal tract cancer. We present the first documented case of a patient with Non-Small Cell Lung Cancer (NSCLC) undergoing Bevacizumab therapy that developed transmural necrosis of the colon without metastatic disease involvement or other primary malignancies.

**Case Presentation:** In May of 2016, a 57-year-old female was diagnosed with metastatic NSCLC involving the right upper lobe, mediastinum, and the pre-tracheal region. She initially presented to our emergency room with right shoulder pain for 2 months and denied weight loss, fever, chills, or cough. The patient had a 20-pack year smoking history and quit 6 months prior to presentation. She reported no other medical problems but had not seen a physician in over 20 years. The patient's husband also had a history of lung cancer for which he was in remission after undergoing surgery and chemotherapy. Two months after initial presentation, chemotherapy was started with Carboplatin and Pemetrexed for 6 cycles. Restaging imaging after the 6 cycles showed that the right upper lobe mass increased in size to 4.0 cm x 2.8 cm. The patient was also complaining of worsening SVC syndrome symptoms. At this time, the patient underwent consolidative radiation and was placed on maintenance Pemetrexed and was started on Bevacizumab (15 mg/kg) on a 3-weekly schedule. After the 7<sup>th</sup> cycle of Bevacizumab treatment, the patient developed severe abdominal pain, nausea, and a one week history of obstipation. On physical examination, the patient was tachypneic, tachycardic, and hypotensive with abdominal tenderness. She was intubated in the emergency room due to her declining clinical state. Radiography demonstrated distal sigmoid wall thickening, distended cecum and transverse colon, but no obvious free intraperitoneal air. The patient declined during the first day of admission therefore she was taken emergently to the operating room. We initially planned on placing an end colostomy; therefore a left lower quadrant incision was made. Upon entering the abdomen, we appreciated the entire colon to be compromised from the ileocecal valve to the distal sigmoid. Interestingly, the patient's small bowel appeared healthy without any evidence of ischemia or necrosis. The patient underwent a total colectomy and an end ileostomy. Postoperatively, the patient had a tenuous course requiring prolonged intubation and poor incisional healing, but ultimately, she made a full recovery except that she developed complete blindness. The pathology showed ischemic colitis with transmural necrosis that extended from the ileocecal valve to the sigmoid colon with intact mucosa at the proximal and distal margins. Of importance, there was no malignancy appreciated in the specimen. The specimen was described as: "At the ileocecal valve there is an abrupt transition from essentially normal mucosa to uniformly necrotic appearing thin cobble-stoned mucosa." The pathologist further describes the diseased bowel as "paper thin."

**Conclusion:** The addition of Bevacizumab to the therapy in advanced NSCLC has improved mortality overall but has serious adverse effects that are just now coming to light with its expansive use in the treatment of malignancies. In conclusion, all patients undergoing Bevacizumab have the potential for the serious side effects of gastrointestinal

perforation and any concern should prompt clinical evaluation and intervention.

### **Incidental Finding Of Diffuse Parietal Pleural Carcinoid Nodules During Resection Of Right Upper Lobe Carcinoid Tumor**

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**Introduction:** Carcinoid tumors, or neuroendocrine tumors (NETs), are a relatively uncommon disease found in approximately 5 in every 100,000 people in the general population. Pulmonary carcinoids represent ~25% of these cases. Typically found centrally, and closely associated with bronchial tissue, they range in behavior from indolent typical carcinoids, to more aggressive atypical carcinoids and, more recently, have been described as diffuse idiopathic pulmonary neuroendocrine cell hyperplasia (DIPNECH), which the World Health Organization has defined as the multifocal neuroendocrine cells or “tumors” within lung and broncheolar tissue. While multifocal disease is not uncommon in these patients, the presence of pulmonary carcinoid in the parietal pleura is exceedingly rare, representing only 4 case reports in English literature.

**Methods:** The authors present the case of a 71 year old female with no history of smoking who presented with complaints of a lingering cough. Her work up identified a 2.4 x 1.7 x 2.0 cm mass in the right upper lobe which was found upon biopsy to be a neuroendocrine tumor. She had additional tiny nodules of uncertain significance in both lungs. She was taken to the operating room for a video assisted thoracoscopy and right upper lobectomy; however, upon entry into the right chest, small, pale, sub-centimeter nodules on the parietal pleura were seen. Initial intraoperative biopsy was indicative of neuroendocrine tumor/carcinoid. Given the indolence of her disease, the right upper lobectomy was completed, she did well post operatively and was discharged home.

**Results:** Final pathology was consistent with a diagnosis of typical carcinoid, Stage IVa, with few mitoses, and found the cells expressed pancytokeratin, chromogranin, synaptophysin, and CD56. Subsequent review of her imaging with a thoracic radiologist did not identify any evidence of these nodules.

**Conclusion:** Our patient was found to have previously undescribed diffuse nodular involvement of the parietal pleura by carcinoid tumor, making this case unique. The few prior cases of pleural carcinoid have presented with masses evident on imaging, or progressive findings such as a pleural effusion eliciting investigation. The patient had a known right upper lobe carcinoid which may suggest a rare pathway of metastasis; however, she also had a very indolent presentation and tiny diffuse intrapulmonary nodules which suggest the possibility of a rare presentation of DIPNECH involving the pleura. Unfortunately, data guiding systemic treatment for this clinical picture is unavailable given the rarity of its presentation. She continues to follow with her oncologist for future therapy. This patient’s case, further follow up and treatment strategies will be described.

### **Clinical Oncology, Plastic and Reconstructive Surgery Combining Innovative Technology with Contemporary Surgical Techniques: First Robotic Assisted Enucleation of a Pancreatic Neuro-Endocrine Tumor (PNET) Using a 3D Printed Model of Patient Specific Anatomy**

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**Introduction:** Pancreatic Neuroendocrine Tumors (PNET) comprises 3% of the pancreatic neoplasia and 7% of all the Neuroendocrine tumors. WHO 2010 classification of Well-Differentiated PNET stratifies them into 3 categories based upon Mitotic Count/10HPF and Ki-67 Index (%). Patient with tumors that are less than 2cm or those documented to have a low proliferative index (Ki-67) can safely undergo tumor enucleation rather than more aggressive pancreatoduodenectomy or distal pancreatectomy. With the advent of robotic assisted surgical techniques, minimally invasive approaches towards pancreatic enucleation are gaining popularity. Use of 3D printing to preoperatively delineate the pancreatic and biliary anatomy is an innovative way to safely perform these surgeries.

**Methods:** A 63 year old female presented with chronic abdominal pain which was thought to be secondary to previous diagnosis of Irritable bowel syndrome. Upon CT of abdomen and pelvis, she was found to have a 1.1 x 1 x 0.8 cm round mass in the neck of the pancreas that showed avid enhancement on early arterial phase imaging and gradual washout on consecutive delayed phase imaging. These findings were suspicious for a neuroendocrine tumor which was later confirmed on Esophagogastroduodenoscopy (EGD) and endoscopic ultrasound (EUS) with fine needle aspiration cytology (FNAC). MRI/MRCP showed that mass is in close proximity to the pancreatic duct. In order to better outline the anatomy and aid in dissection via a minimally invasive approach, two 3D printed models of patient anatomy were created; first one of soft tissue with pancreatic and common bile duct and second one specifically for arterial anatomy.

**Results:** Pre-operatively, patient anatomy was studied using the 3D printed model. We started the procedure by performing diagnostic laparoscopy and confirming absence of metastasis. Da Vinci Xi Robot was docked and we dissected the gastrocolic omentum and entered the lesser sac. We noted a mass in the neck of the pancreas towards the superior border. At that time, an intra-operative ultrasound was performed that showed a small 1 cm mass in the neck of pancreas in close proximity to the pancreatic duct and the splenic vessels, in perfect agreement with our 3D printed models. With the help of bipolar electrocautery and a blunt grasper, gentle retraction and careful dissection was performed and the tumor was removed. During the dissection, we frequently referred to the 3D model for orientation. Once the mass was completely removed it was sent for frozen section. On frozen section it was noted to be pancreatic neuroendocrine tumor which was later confirmed on final pathology as well. Her post-operative course was unremarkable, and she reported relief of her preoperative pain.

## Plastic & Reconstructive Surgery

### Accuracy of 3D MRI Based Volumetry for Preoperative Estimation of Breast Implant Volume in Implant Replacement for Capsular Contracture

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**Introduction:** Capsular contracture is an immune mediated process that can occur with any implant of a foreign body that can cause pain, discomfort, and change the aesthetic result of breast reconstruction or augmentation. Treating severe capsular contracture can necessitate surgical capsulotomy or capsulectomy and replacement of breast prosthetics. The volume of a replacement prosthetic has important implications to outcomes relative to the replaced prosthetic. In the setting of missing surgical documentation from a patient's prior operation, the volume of the original prosthetic is unknown prior the operation. A bench comparison of MRI volumetry using 3D post-processing to actual manufacturer reported implant volumes has demonstrated mean deviation of  $2.2-3.1 \pm 1.7-3.3\%$  depending on the software package<sup>1</sup>. Here we describe the use of preoperative 3D MRI volumetry in a patient undergoing capsulotomy and implant replacement for contracture and compare MRI volumetric assessment with on-table fluid displacement volumetry at the time of operation.

**Methods:** A single patient was preoperatively imaged with MRI for screening purposes. Subsequently, due to inability to obtain old operative notes to determine the size of the initial implant, MRI data was sent to the 3D lab for implant volumetry by digital post-processing. The patient was thereafter taken to the operating room for bilateral breast prosthetic explantation, bilateral capsulotomies, and replacement with new bilateral breast implants. Volume of removed implant was assessed by simple fluid displacement at the time of operation.

**Results:** 3D MRI post-processing estimated the left breast volume axial volume to be 314 mL and the left breast volume sagittal volume to be 313 mL. On table fluid displacement testing of the left breast implant was estimated to be 300 mL.

**Conclusion:** 3D MRI volumetry can be used to preoperatively estimate the volume of an in vivo breast implant with a reasonable degree of accuracy when the original volume is unknown. Further study will be undertaken to determine the efficacy and efficiency of using MRI vs other 3D imaging techniques to preoperatively determine implant volumes.

#### References:

1. Herold C, Reichl A, Stieglitz LH, Dettmer S, Knobloch K, Lotz J, and Vogt PM. MRI-Based Breast Volumetry – Evaluation of Three Different Software Solutions. *J Dig Imag*, 23(5) 603-610.

**Conclusion:** Using a 3D Printed Model, we were able to better understand and anticipate the patient anatomy in this delicate operation. This was our second such operation, the first being resection of a retro-peritoneal leiomyosarcoma. We hope that this technology will help us in the future to perform complicated surgeries with a minimally invasive approach and at the same time deliver optimum results.

### Lung Adenocarcinoma Manifesting as a Metastatic Axillary Mass

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**Introduction:** Approximately 85% of lung cancers are symptomatic at presentation; the remaining 15% are detected incidentally on radiographic imaging, typically a chest x-ray or CT scan. Seldom is lung cancer diagnosed after the detection of a metastatic lesion. Nearly 40% of lung cancers are adenocarcinomas. Historically, local nodes, bone, lung, brain, liver and adrenal glands represent the most common sites of metastasis for this subtype. Distant lymph node metastases are rare, however, and not well-represented in the literature.

**Case Presentation:** We describe the case of a 63-year-old female ex-smoker who presented for evaluation of a palpable right axillary mass. Bilateral mammogram shows no suspicious lesions in the breasts, however noted the right axillary lesion as suspicious abnormality. Axillary ultrasound visualized the palpable mass as an isoechoic mass with central hypoechoic area and central vascular flow, not typical appearance of a lymph node. Given the vascular nature of the lesion, the patient opted for an excisional biopsy in the operating room. Patient was booked for excision with concerns of breast pathology. However, during pre-operative workup, a right-sided lung nodule was found incidentally on chest x-ray. Workup of the nodule included CT guided biopsy and PET-CT. Biopsy of the lung nodule revealed poorly differentiated lung adenocarcinoma. In addition to identifying the right lung mass, the PET-CT demonstrated active right hilar lymph nodes and confirmed presence of a hypermetabolic right axillary mass/lymph node. Patient underwent excisional biopsy of the axillary mass. During the procedure, the mass was noted to be in the subcutaneous space. Mass was excised in its entirety and pathology revealed high grade malignant neoplasm consistent with metastasis from known poorly differentiated adenocarcinoma of the right lung.

**Discussion:** Lung cancer remains the number one cause of cancer-related mortality in the United States for men and women. Observed patterns of metastasis can help predict the clinical presentation of dissemination of a given primary. However, there will always be outliers; this case highlights the importance of thorough workup for suspected malignancy, as well as maintaining certain degree of clinical suspicion in situations where the diagnosis seems obvious.

## ***Clinical Oncology, Plastic and Reconstructive Surgery***

### **The Challenges of Redo Orthognathic Surgery**

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**Introduction:** Redo orthognathic surgery has received little attention in literature. The purpose of this study was to (1) identify indications of redo cases (2) describe technical challenges, and (3) compare characteristics and outcomes to a matched cohort of primary procedures.

**Methods:** This was a retrospective review of 16 redo and 16 age/race-matched primary patients, operated by the senior author. Redos, defined as re-osteotomy Le Fort, BSSO, or genioplasty, were compared to their respective past surgeries and matched primaries. Data were combed for demographic, perioperative, and postoperative data. Statistical analysis was performed using student T-tests and z-scores.

**Results:** Redo was required most often for newly created deformities (69%), largely an outcome of bony malposition (all resulting in asymmetry and malocclusion secondary to original planning, execution, and/or healing), and less for undercorrection or relapse toward original deformity (50%). Redos more frequently required all three osteotomies to correct the deformities, compared to their respective past surgeries (25% vs. 63%;  $p=0.016$ ). 3D planning/VSP was less common in the past surgery (31% vs 87.5%;  $p<0.001$ ). When compared to a matched primary cohort, sagittal corrections (mandibular retrognathia and maxillary hypoplasia) were more common operative indications in the primary group ( $p<0.05$ ), while transverse and vertical corrections (asymmetry and gingival show) were more common triggers in redos ( $p<0.05$ ). The average surgical time for redo procedures was greater than for primaries (308 vs 241min;  $p=0.036$ ). Hardware required removal in 88% redo procedures and no primaries ( $p<0.0001$ ). Overall complication rate was similar, with a higher incidence of late infection (>2 weeks post-op) in the redo cohort (13% vs 0%;  $p=0.026$ ).

**Conclusions:** Redo orthognathic surgery is most often required for new/iatrogenic deformities, with emphasis on fine tuning transverse and vertical movements. A lack of 3D planning before initial surgery is a predictor of reoperation. Scarring, bony alterations, hardware removal, and the need for increased multi-jaw osteotomies lead to greater technical difficulty, operating time, and late infections. Despite these challenges, outcomes and postoperative course are good. This study begins to shed light on the causes, challenges, and outcomes present in redo orthognathic surgery.

### **Excision of a Massive Facial Tumor in Ecuador: A Case Study in Global Surgery**

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Hartford Hospital/UCONN School of Medicine

**Introduction:** Global Health is a growing area of much importance in medicine. There is value to be gained from both sides of the international surgery equation. Surgeons have to opportunity to share their knowledge and skillset in underserved global populations, while seeing and experiencing disease that is rare in the United States and other more developed countries.

**Methods:** This paper seeks to tell the narrative of a patient in his mid-thirties who arrived to be treated by surgeons on a mission trip to Ecuador from the United States. The man had a giant left sided facial tumor that he had been living with for five years. He was unable to find a local surgeon who would treat this. He did have a prior, much smaller tumor that had been removed in the same area several years prior. The tumor recurred and the patient was unable to receive the necessary medical attention because of barriers including access to healthcare and payment. He did not have any of his prior health records.

**Results:** Our surgeons were able to have the mission's sponsor donate funding to purchase imaging in the form of CT scan. With modern technology, they were able to remotely consult with other specialists in the United States. The decision was made to remove the tumor, taking into consideration the location of the facial nerve with respect to this tumor. The 18 x 12 x 9 cm tumor was removed successfully after several hours and the pathology ultimately confirmed a recurrent pleomorphic adenoma. The local foundation also agreed to pay for postoperative radiation therapy, in hopes of decreasing risk of recurrence.

**Conclusion:** This is just one of many examples of the value of global surgery. This experience allowed our surgeons the opportunity to encounter and treat a rare facial tumor. With the standard of modern medical care in the United States, it is very unlikely that a tumor would ever grow this large without being treated, even in the poorest and most underserved areas. This international interaction also allowed a man who was unable to receive medical attention for many years the opportunity for treatment and improvement of his quality of life.



### **Factors Associated with Reconstruction in Patients Undergoing Mastectomy**

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Yale University

**Introduction:** Breast reconstruction after mastectomy has been shown to be oncologically safe, and compared to no reconstruction, has been associated with improved quality of life and body image. There have been few studies, however, that have investigated factors that influence the decision to undergo reconstruction, and the type of reconstruction chosen.

**Methods:** Medical records of all female patients with Stage 0-3 breast cancer undergoing mastectomy at a large academic institution between July 2013 and July 2016 were reviewed. Factors associated with (a) the receipt of reconstruction, and (b) whether this was autologous or tissue expander/implant based, were analyzed using non-parametric statistical analyses on SPSS version 24.

**Results:** A total of 505 patients were included in this cohort, with a median age of 52 (range 22-90). 397 patients (78.6%) decided to have reconstructive surgery; of these, 395 (99.5%) were done in the immediate setting. Younger age (median age 50 vs. 66,  $p<0.001$ ), earlier disease stage ( $p=0.015$ ), insurance status ( $p<0.001$ ), and receipt of bilateral mastectomy (92.0% vs. 57.0%,  $p<0.001$ ) were associated with higher rates of reconstruction. While patients who were diabetic were less likely to opt for reconstruction (56.8% vs. 80.7%,  $p=0.001$ ), no correlation was seen in terms of smoking status ( $p=0.330$ ), body mass index (BMI) ( $p=0.099$ ), or race ( $p=0.240$ ). On multivariate analysis, younger age (OR=0.896; 95% CI: 0.864-0.929,  $p<0.001$ ) and bilateral mastectomy (OR=3.519; 95% CI: 1.941-6.379,  $p<0.001$ ) were the only factors found to be independently associated with the decision to undergo reconstruction. Of the 397 patients who had reconstruction, 200 had implants (50.4%) and 197 had flaps (49.6%). Never-smokers were more likely to opt for implants (55.1%) vs. current or former smokers (43.6%,  $p=0.025$ ), while black patients ( $p=0.038$ ), those with higher BMIs (median 29.02 vs. 23.93,  $p=0.001$ ) and those with later disease stage ( $p=0.015$ ) tended to undergo autologous reconstruction. Insurance type ( $p=0.485$ ), history of diabetes (0.839), patient age ( $p=0.431$ ), and whether patients were having bilateral mastectomy ( $p=0.654$ ), did not differ between patients choosing implants and those choosing flaps. On multivariate analysis, only higher BMI (OR=1.145; 95% CI 1.097-1.196,  $p<0.001$ ) remained an independent predictor of flap reconstruction.

**Conclusion:** Over three quarters of patients undergoing mastectomy had reconstruction done in the immediate setting, with younger patients and those undergoing bilateral mastectomy more frequently opting for reconstruction. Type of reconstruction, however, was affected primarily by BMI, with those with higher BMI opting for autologous reconstruction.

## **Surgical Quality, NSQIP and ERAS**

*Sponsored by the*



### **Moderator:**

**Alan Meinke, MD, FACS**

Private Practice, Surgeons of Westport, Westport, CT  
Vice Chairman, Department of Surgery and Director of  
Surgical Quality, Norwalk Hospital, Norwalk, CT  
Vice Chair, Chief of Surgery and Assistant Professor of Surgery  
Vermont School of Medicine, Burlington, VT

### **Judge:**

**Gerald Healy, MD FACS, FRCSire, FRCS**  
Past President, American College of Surgeons,  
IHI Senior Fellow

## Surgical High Reliability Program: SHaRPening the Tools of the Trade

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<sup>\*</sup>Saint Francis Hospital & Medical Center—Trinity Health of New England <sup>†</sup>University of Connecticut School of Medicine

**Introduction:** Graduate Medical Education programs have increasingly required resident engagement in quality improvement and patient safety initiatives. Despite the efforts of the American College of Surgeons, quality improvement curricula are not a well-integrated into the learning programs of many residency programs.<sup>1,2</sup> The ACGME provides programs with an annual resident survey to “monitor graduate medical clinical education” inclusive of patient safety and teamwork as domains. In affiliation with the University of Connecticut School of Medicine’s accredited General Surgery Residency, a curriculum was created to reflect a team-based, interactive experience in high reliability training for surgery residents. High reliability training includes understanding of organizational effectiveness, efficiency and culture, customer satisfaction, documentation, and compliance, with an overarching directive to provide safe, high quality patient care. We compared the results of program residents on the ACGME Survey in the years before, during, and after initiation of the high reliability and safety training.

**Methods:** A comprehensive High Reliability curriculum was developed at the Saint Francis Hospital & Medical Center and provided to the University of Connecticut School of Medicine’s General Surgery Residency. The curriculum consists of an 18-month program of interactive and group-work-focused learning sessions. The University of Connecticut is an accredited general surgery program, and participates in the ACGME resident survey annually. The ACGME Survey was administered annually with a response rate of >90%. The curriculum started in 2014-15 academic year, ending in the midpoint of 2016 year, prior to the 2015-16 survey.

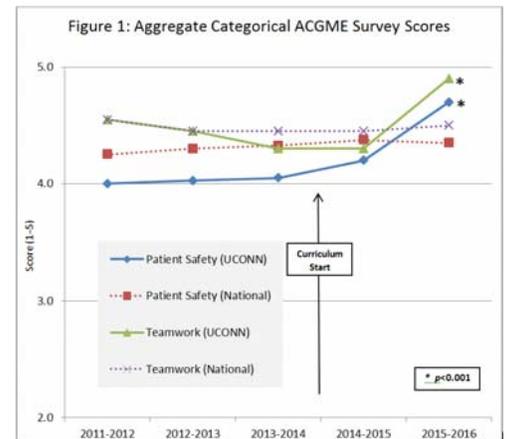
**Results:** UCONN Surgery Program survey results scored at or below the national mean in the domains of patient safety and teamwork at baseline. Aggregate domain scores are depicted in figure 1, and improved from at or below the national mean to above the national mean in the years after the curriculum was completed. Individual scores also improved uniformly (not pictured); Questions 1-4 are related to patient safety and quality: Q1 (regarding roles of faculty and residents), pre-curriculum mean was 4.5, improving post-curriculum 4.8 (2015-16,  $p < 0.0001$ ). Q2 (involving cultural reinforcement of patient safety responsibility), pre-curriculum mean was 4.3, improving post-curriculum to 4.9 (2015-16,  $p < 0.0001$ ). Q3 (pertaining to participation in quality improvement efforts), pre-curriculum mean was 3.7 improving to 4.7 (2015-16,  $p < 0.0001$ ). Q4 (information transfer during shift changes or transfers) pre-curriculum was 3.7 improving to 4.4 in 2015-16 ( $p < 0.0001$ ). Questions 5 and 6 inquire about work and effectiveness with inter-professional teams. Q5 demonstrated improvement from 4.4 to 4.9 (2015-16  $p < 0.0001$ ), and Q6 showed similar effect, initially 4.2 improving to 4.9 (2015-16,  $p < 0.0001$ ). All questions and

aggregate scores demonstrated significant improvement by the first survey after curriculum completion.

**Conclusion:** A curriculum of high reliability training including team-based training on error generation, organizational culture, human factors contributions, communication methods and conflict resolution skills

can change the culture in a program of surgical residents. A program that previously scored consistently below the national average on the ACGME survey in the domains of teamwork and patient safety was able to improve their involvement both in these domains as measured on the ACGME survey as well as in several domains measured on the SAQ, a global assessment of safety attitudes across the healthcare spectrum. Dissemination of the curriculum to other specialties has already begun.

- <sup>1</sup> Djurichich AM, Ciccarelli M, Swigonski NL. *Academic Medicine*, 2004; 79(10):S65-S7.  
<sup>2</sup> Boonyasai, R.T., Windish, D.M., Chakraborti, C., Feldman, L.S., Ruben, H.R. and Bass, E.B., 2007. *JAMA*, 298(9):1023-1037.  
<sup>3</sup> Wong, Brian M., Wendy Levinson, and Kaveh G. Shojania. *Medical education* 46.1 (2012): 107-119.  
<sup>4</sup> Windish, D.M., Reed, D.A., Boonyasai, R.T., Chakraborti, C. and Bass, E.B., 2009. *Academic Medicine*, 84(12), pp.1677-1692.  
<sup>5</sup> Courtlandt C, Noonan L, Korick MW, Zeskind PS, Mabus S, Feld L. *J Grad Med Educ*, 8(1):74-79.  
<sup>6</sup> <http://www.acgme.org/Data-Collection-Systems/Resident-Fellow-and-Faculty-Surveys>, accessed August 7, 2017.



## The Impact Of Electronic Medical Records Documentation On Surgical Residents' Training

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**Introduction:** The implementation of electronic medical records (EMR) documentation has had a particularly large influence on the medical community. However, it is uncertain how EMR documentation impacts surgical residency training. This study elicits the opinion of the surgical residents with the hypothesis that EMR documentation impacts the surgical resident's training. An extensive questionnaire was designed to investigate the impact in detail.

**Methods:** Hospitals in the state of Connecticut were randomly selected to participate in the study. Program coordinators were contacted with a request for email addresses of all surgical residents. Emails were sent out with a link to an online survey. A total of 259 individuals were invited to participate in the study. Seventy eight participated. Data was collected and subject to statistical analysis. All statistics were performed on GraphPad Prism. Normality tests, including the D'Agostino and Pearson omnibus normality test, were used to determine if the data

exhibited a Gaussian distribution. Furthermore, a one-sample t test was used to compare the expected mean to the actual mean of the data.

**Results:** When asked if note creation interfered with operative training, 81.6% agreed (p-value of <0.0001). When asked if note completion interfered with patient interaction, 79.5% agreed (p-value of <0.0001). When asked if note completion interfered with attending interaction time, 69.2% agreed (p-value of <0.0001). When asked if note completion interfered with reading time, 79.5% agreed (p-value of <0.0001). When asked what percent of duty hour violations was due to completing notes the following data was obtained:: For 33.3% of participants, 0% of violations was due to note completion. For 7.7% of participants, 1-9% of violations was due to note completion. For 7.7% of participants, 10-19% of violations was due to note completion. For 10.3% of participants, 20-29% of violations was due to note completion. For 7.7% of participants, 30-39% of violations was due to note completion. For 7.7% of participants, 40-49% of violations was due to note completion. For 7.7% of participants, 50-59% of violations was due to note completion. For 2.6% of participants, 60-69% of violations was due to note completion. For 2.6% of participants, 70-79% of violations was due to note completion. . For 7.7% of participants, 80-89% of violations was due to note completion. For 2.6% of participants, 90-99% of violations was due to note completion. For 2.6% of participants 100% of violations were due to note completion (p-value of <0.0001).

**Discussion:** The literature has recognized that post- EMR implementation resulted in increased time spent documenting. However, with the Accredited Counsel For Graduate Medical Education (ACGME) restricting the residency work week to 80 hours a week one must ask, what part of the surgical residency training is being sacrificed for increased charting time? Surgical residents agreed that note creation interfered with operative, patient interaction, learning from attendings, and reading time, at 81.6%, 79.5%, 69.2%, and 79.5% respectively, all with statistical significance. In fact, as well as documentation interfering with training, it has been shown in this study to be a statistically significant cause of duty hour violations. Sixty six and seven tenths of residents violated study hours to complete notes. The largest percentage of residents, 10.3%, noted 20-29% of duty hours violations were due to note completion.

**Summary:** This study reflects the impact of EMR documentation on surgical residency training. In an 80 hour restricted work week, note creation is consuming a large amount of time that residents feel interferes with their training and contributes significantly to work hour violations.

#### **Resident involvement in Colon Protocol leads to decreased Surgical Site Infections in Colon Resections**

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*Stamford Hospital*

**Introduction:** Surgical Site Infections (SSIs) represent a significant burden for patients undergoing surgical

interventions as they are associated with increased morbidity, length of stay, and increased healthcare spending. Colorectal surgeries are of particular interest as they are associated with higher rates of SSIs and quality improvement programs have highlighted the need for institution-specific bundles that serve to standardize validated preoperative, intraoperative, and postoperative interventions. We hypothesized that establishing a resident-drive bundle program in a single institution will significantly decrease the rate of SSIs in patients undergoing colonic resections.

**Method(s):** A standardized Bowel resection protocol was created with both a pre-op and post-op debriefing. All Colon resections starting in 2014 followed the protocol and the incidence of surgical site infections were recorded. From July 2015-July 2016 resident involvement was absent, and the emphasis on the protocol decreased. Resident involvement returned from August 2016 to July 2017. The rate of surgical site infections was compared between the 3 periods.

**Results:** After the initiation of a standardized protocol for colon resections there was a significant decrease in the rate of surgical site infections. After the initial resident leadership graduated, there was decreased compliance with the protocol and a subsequent increase in surgical site infections. After resident involvement was reinitiated there was an increased compliance in the use of the protocol.

**Conclusions:** A standardized protocol for colon resections lead to a decrease in surgical site infections. Resident involvement leads to improved compliance and awareness in a colon protocol and leads to decreased surgical site infections for elective surgeries.

#### **Enhanced Recovery in the Elderly, Diabetic and High Risk Patient**

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*St. Francis Hospital*

**Objective:** To study the outcomes of an ERAS (Enhanced Recovery after Surgery) program in the geriatric, diabetic and high risk colon resection patient with an ASA (American Society of Anesthesia) score of 3 to 4.

**Background:** ERAS clinical pathways have been shown to reduce length of stay, morbidity, need for critical care transfer, costs and thirty day readmission rates. Up to this date there has been little published data comparing the outcomes for the elderly and multiple co-morbidity elective resection patient.

**Methods:** Data were compiled from a single academic institution, (St. Francis Hospital and Medical Center), in a retrospective review utilizing the Eras Interactive Audit System database (EIAS, Encare, Stockholm, Sweden). A cohort of 366 adult, consecutive, elective colon or rectal resection patients of which 184 underwent operation pre-ERAS implementation, 179 were identified as post-ERAS, 140 were > 70 years of age, 82 were diabetic and 124 were ASA 3 or 4. Patients were followed for thirty days post operatively. The primary outcomes of length of stay, complications and readmission rates were evaluated.

**Results:** In all patients median length of stay was reduced from 5 days to 3 days ( $p < 0.01$ ) which is likely secondary to earlier resumption of GI function as measured by a median decrease from 3 to 2 days in the time to first flatus ( $p < 0.01$ ) and medical complication reduction from 31.5% to 15.1% ( $p < 0.01$ ). In addition an average cost savings of \$3,000 per case for sigmoid resection and right hemicolectomy was realized. The savings were greater in laparoscopic cases and less in robotic facilitated procedures. Outcomes in the > 70 years old, diabetic and ASA 3-4 patients revealed a similar reduction in mean admission days from 5 to 4 ( $p = .03$ ) as well as time to first flatus from 3 to 2 days ( $p < .01$ ), with no increase in readmissions (9.3% pre-ERAS and 4.6 % post-ERAS). A similar reduction in medical complications from 30% to 13 % ( $p = 0.01$ ) was noted as well as reduction in post op ileus from 23% to 8%.

**Conclusions:** Implementation of an ERAS program in the elective colon resection patient is of benefit to the young, healthier patient as well as those in the higher risk category such as the elderly, diabetic and those with multiple comorbidities. This is likely due to closer review of patient factors that correlate with worse outcomes and efforts at attenuating the stress response to surgery as well as optimization. In addition there is a substantial cost savings for all patients.

#### **The Impact Of An Enhanced Recovery Program On Outcomes After Laparoscopic Colorectal Surgery**

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<sup>1</sup> University of CT School of Medicine

<sup>2</sup> The Hospital of Central CT

**Introduction:** We know that laparoscopy already confers a large benefit to surgical patients when compared to open surgery with regard to decreased stress response, less pain medication usage, and shorter length of stay. Our question is asking if enhanced recovery protocols confer ADDITIONAL benefit to laparoscopic colorectal surgery patients.

**Methods:** Retrospective review of laparoscopic colon cases

- 1/2015 – 7/2015, pre-ERAS, (n=30)
- 1/2016 – 7/2016, ERAS cases, (n=29)

Comparison of patient factors, PONV and pain medications, diet, complications, length of stay

Data compiled in Access/SPSS, Version 22. Categorical data analyzed using chi-squared and Fisher's exact test; continuous data using Student's t-test and ANOVA.

**Results:** We found a statistically significant decrease in mean length of stay between pre-ERAS and ERAS groups from 3.9 to 3.0 days and a median decrease from 4 to 2 days. There was no significant change in the incidence or distribution of complications.

**Conclusion:** We found a statistically significant difference in hospital stay after implementing an enhanced recovery protocol in a laparoscopic colorectal surgery group. There was no significant change in the incidence or types of complications. The groups were not fully comparable, with

a higher proportion of ASA III and cancer diagnoses in the pre-ERAS group. We found that our measures were well implemented as evidenced by anti-emetics and non-narcotic usage. Early nutrition was being delivered reliably as well.

#### **Markers of Malnutrition in Patients Undergoing Esophagectomy: An NSQIP Analysis**

Jahnvi Kakuturu MD, Shohan Shetty MD  
*Saint Mary's Hospital*

**Introduction:** Patients with esophageal cancer frequently present with dysphagia resulting in poor nutritional status. The aim of this study was to investigate the impact of recent weight loss and hypoalbuminemia on postoperative outcomes following esophagectomy for malignant indications.

**Methods:** Patients undergoing esophagectomy for a diagnosis of malignancy, from 2007-2014 were identified using the American College of Surgeons National Surgical Quality Improvement Program database. Thirty day postoperative outcomes were assessed for patients with recent weight loss, hypoalbuminemia (albumin < 3.5 g/dL), or a combination of both.

**Results:** Of 4276 patients, 627 (14.7%) had a history of recent weight loss (WL) alone, 553 (12.9%) had preoperative hypoalbuminemia (HA) alone, while 300 (7.0%) had a combination of both. The remaining 2796 (65.4%) patients had neither of these measures. On univariate analysis, patients with HA and combined WL and HA were found to have increased 30-day morbidity and mortality when compared to the control group (Table 1). These two groups also had an increase in specific complications, namely, pneumonia, unplanned re-intubation, ventilatory support >48 hours, intraoperative or postoperative bleeding requiring transfusion, deep vein thrombosis, septic shock and increased length of hospital stay (Table 1). Multivariate analysis controlling for age, gender and operative time revealed a 1.5-fold increase in complications with hypoalbuminemia alone, while combined weight loss and hypoalbuminemia increased both 30-day morbidity and mortality (OR 1.5 and 2.7, respectively). Weight loss alone was not predictive of increased complications or death.

**Conclusion:** In this national sample of patients undergoing esophageal resection for malignancy, hypoalbuminemia alone was found to be associated with a higher rate of overall complications, while hypoalbuminemia with weight loss resulted in both increased complications and death. Correction of these measures preoperatively may help to ameliorate postoperative complications in patients with esophageal cancer.

Table 1. Univariate analysis of post-operative complications

Variable	Neither HA or WL (n=2796)	WL (n=627)	HA (n=553)	Both WL and HA (n=300)	P Value
30-day mortality (%)	3.3	2.6	5.1	8.3	<0.01
30-day morbidity (%)	44.6	43.4	54.6	55.0	<0.01
Pneumonia (%)	14.8	14.0	19.2	21.3	<0.01
Re-intubation (%)	12.5	11.6	17.2	20.3	<0.01
Vent. support > 48hr (%)	13.0	10.5	17.5	17.3	<0.01
Bleed requiring transfusion (%)	13.6	14.2	23.9	24.3	<0.01
DVT (%)	3.9	3.4	6.5	6.0	0.01
Septic Shock (%)	6.1	5.1	8.0	11.3	<0.01

## **Specialty Surgery**

Moderator:

Christine Rader, MD, FACS

Director, Extracorporeal Membrane Oxygenation Program

Connecticut Children's Medical Center, Hartford, CT

Assistant Professor of Pediatrics and Surgery,

University of Connecticut School of Medicine, Farmington, CT

Judge:

Felix Y Lui, MD, FACS

Associate Professor of Surgery; Director,

Surgery Clerkship Program,

Yale School of Medicine, New Haven, CT

### **Mycotic Pseudoaneurysm of the Superior Mesenteric: Case Report in Patient with History of Intravenous Drug Use**

Devin Gillaspie, MD, Patrick Zimmermen, DO, Alan Dietzek, MD  
Danbury Hospital

**Introduction:** Mycotic pseudoaneurysm is a severe vascular sequela of intravenous drug use that can result in limb loss, hemorrhage, sepsis, or death. Mycotic aneurysms can develop either at the site of drug injection, secondary to septic embolization from infectious endocarditis, or secondary to seeding in the arterial wall in the setting of bacteremia. Visceral artery pseudoaneurysms are rare, with a prevalence of 0.2-1% in the general population. Aneurysm of the superior mesenteric artery (SMA) is the most common site for pseudoaneurysm of the splanchnic arteries, and the most common cause of SMA pseudoaneurysm is infection. We present an interesting case of mycotic aneurysm of the SMA in a patient with a history of intravenous drug use.

**CASE PRESENTATION:** The patient is a 37-year-old female with a history significant for intravenous drug use, who presented to the emergency department with abdominal pain, nausea, vomiting, and fever. She was admitted with sepsis and found to have blood cultures positive for Methicillin-Resistance *Staphylococcus aureus*. She complained of acutely worsening abdominal pain on hospital day five and CT scan was obtained which revealed a pseudoaneurysm of the SMA measuring 4.8 x 3.8 cm. On review of imaging studies, it was noted that there were no identifiable distal blood vessels available for bypass. However, given the high risk of rupture of SMA aneurysms the patient was taken urgently to the operating room. Selective angiography of the SMA was performed which revealed a large pseudoaneurysm and no blood vessels distal to the aneurysm were visualized. Exploratory laparotomy with ligation of the SMA and excision of the aneurysm was performed. As expected, there were no vessels large enough for bypass, and all distal vessels appeared thrombosed. The bowel was inspected and was noted to be viable under fluorescein and Wood's lamp both at the time of initial surgery as well as during a scheduled second look. Eventually the patient underwent abdominal closure without need for bowel resection. Her post-operative course was prolonged and complicated by kidney failure and respiratory failure requiring tracheostomy. However, ultimately the patient was discharged to home tolerating a regular diet.

**CONCLUSION:** Mycotic pseudoaneurysm of the SMA is a rare complication of intravenous drug use. They carry a 38-50% risk of rupture, and 22-40% overall risk of mortality, which increases to 75% with rupture. The most common presenting symptoms are abdominal pain and fever, and the diagnostic test of choice is CT angiogram. Due to the high risk of rupture, surgical intervention is recommended soon after diagnosis of SMA pseudoaneurysm. The surgical treatment of choice is ligation of the SMA with or without revascularization, and excision of the pseudoaneurysm. When reconstruction is performed, the recommendation is use of autologous vein when possible, as use of synthetic graft is generally not

recommended in an infected field. In our patient, revascularization was not an option due to the distal location of the aneurysm on the main SMA trunk. We were fortunate that she had adequate collateral blood flow from the celiac artery and inferior mesenteric artery that she did not require a bowel resection.

(Figure 1) Axial and sagittal views of CT scan demonstrating 4.8x3.8cm abnormality of the superior mesenteric artery (SMA).



### **Retrospective Study of Remission and Recurrence Of Vulvar Lichen Sclerosus In Different Racial/Ethnic Pediatric Groups**

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Children's National Medical Center, Washington, DC; St Francis Hospital and Medical Center

**Background:** Lichen Sclerosus (LS) is an inflammatory disease of unknown etiology that often affects anogenital skin and associated with high recurrence rates after achieving first remission. In the past, lichen sclerosus among kids was thought to be a rare condition, but recent surveys suggest it is one of the most frequently seen pediatric vulvar disorders. There is very little published information regarding the ethnic or racial epidemiology, presentation and natural history of prepubertal LS.

**Methods:** A retrospective chart review was carried out after obtaining institutional review board approval. Cases of vulvar lichen sclerosus were identified based on ICD-9 and ICD-10 diagnosis code for LS from the pediatric adolescent gynecology service (PAG) billing records from 2010 to 2015. Inclusion criteria were girls, age 0-21years, diagnosed with anogenital LS based on typical clinical features, treated in the PAG, Vulvar Dermatology Clinic, and Dermatology Division of Children's National Medical Center. Longitudinal data including demographic characteristics, and assessment were collected. Standard descriptive statistics were utilized.

**Results:** Preliminary data on 14 of the 35 charts reveal that the average age lichen sclerosus symptom onset is 5, however the average age of presentation in the clinic was 7. Self identified ethnicity was as follows: 5 Caucasian, 3 Black, 3 Other, 1 Asian, 1 Hispanic, 1 Unknown ethnicity. 13 of the 14 patients had tried some type of treatment for their symptoms prior to initial consultation. The most common treatment prior to consultation was nystatin (4), followed by low dose steroid cream (3), or moisturizing ointments such as A+D, A+E, desitin, mupirocin, or Vaseline. One patient was falsely diagnosed and treated for pinworms as well as strep vaginitis prior to consultation. 11 of the 14 (79%) patients were treated with clobetasol steroid cream upon diagnosis. A majority of patients were

instructed to perform lifestyle changes including daily baths, and maintain proper hygiene. At the second visit, 3/14 (21%) reported the same symptoms, 9/14 patients (64%) reported improved symptoms, and 2/14 (14%) reported complete resolution of symptoms. At the second visit, 11/14 (79%) patients had improved physical exam findings. 50% of the patients with LS resolved with treatment. The average time of treatment until resolution of physical exam findings for LS was 13 months (range 2-22 months). The average time to first recurrence after resolution was 12 months (range 2-21 months).

**Conclusions:** LS in children presents at a young age and there is a significant delay in diagnosis. Response to treatment is variable and recurrences are noted even after prolonged periods of resolution. Further data regarding LS in children is needed.

### **Bioengineered Nanofiber Scaffold Loaded with Resveratrol Improves Cardiac Function Following Myocardial Infarction: Our Preliminary Findings**

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*University of Connecticut*

**Introduction:** Cardiovascular disease continues to be one of the leading causes of death worldwide. Even with recent advancements in both surgical and medical interventional strategies, mortality due to coronary heart disease (CHD) remains high. Recently, the use of grafts and engineered scaffolds has emerged as a candidate for supporting the myocardium after an ischemic event. Synthetic materials hold promise in that they can be manipulated during manufacturing to mimic the native extracellular matrix of the heart and allow for loading of biologically active substances within the matrix for release. Resveratrol (R) is a naturally occurring plant-based non-flavonoid polyphenolic compound found in many foods including grapes, red wine, berries, and peanuts. Multiple investigations have shown resveratrol to have anti-atherogenic, antihypertensive, anti-inflammatory, anti-oxidant, and vasculogenic properties. In the present study, we created a nanofiber scaffold, made from polycaprolactone (PCL), loaded with resveratrol (PCL-R), and investigated how PCL and PCL-R would impact cardiac function following myocardial infarction (MI) in a murine model.

**Methods:** ICR-CD1 mice aged 8-12 weeks were used for this investigation. The mice were divided into four groups: Sham, MI, MI+PCL, and MI+PCL-R. All mice underwent either thoracotomy with LAD ligation (MI) or sham surgery, and appropriate scaffolds were sutured onto the myocardium of the mice at the time of LAD ligation (PCL or PCL-R). Resveratrol was loaded at a concentration of 7.22mM per square-cm. At 4 weeks, echocardiogram was performed to assess cardiac function, including ejection fraction (EF), fractional shortening (FS). Stroke volume (SV) and cardiac output (CO) were also calculated. One-way ANOVA and students t-test was used to analyze for differences between the groups.

**Results:** The MI+PCL-R group showed a significant improvement in EF, FS, SV, and CO compared with the MI and MI+PCL groups. However, with respect to the MI group, the MI+PCL-R SV and CO also improved, but not to statistical significance. As expected, the Sham group showed a preserved EF and FS significantly when compared with all MI groups. However, there was no difference in CO or SV between the Sham group and any of the MI groups (Table 1).

	Sham	MI	MI+PCL	MI+PCL-R
EF (%)	76.51 ± 2.97	30.85 ± 3.22*	32.67 ± 2.97*	45.28 ± 3.7** <sup>§</sup>
FS (%)	44.88 ± 2.85	14.80 ± 1.68*	15.59 ± 1.54*	22.85 ± 2.15** <sup>§</sup>
SV (μL)	44.73 ± 6.56	39.96 ± 4.74	33.86 ± 3.04	50.9 ± 3.94 <sup>§</sup>
CO(mL/min)	19.02 ± 2.421	17.27 ± 1.942	14.09 ± 1.316	22.302 ± 2.464 <sup>§</sup>

Table 1: 4 week echo results for Sham, MI, MI+PCL and MI+PCL-R groups. \*p<0.0001 compared with sham. <sup>§</sup>p<0.05 compared with MI. <sup>§</sup>p<0.05 compared with MI+PCL

**Conclusion:** To our knowledge, this is the first study in which resveratrol is used as a slow release topical therapy, with the help of a semi-synthetic scaffold support/delivery system, following MI. Overall, cardiac function is significantly improved compared to MI and MI+PCL when the infarcted myocardium is supported with this engineered nanofiber scaffold loaded with resveratrol.

### **Cricopharyngeal Myotomy: A Novel and Definitive Surgical Approach to Dysphagia in Inclusion Body Myositis**

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**Introduction:** Inclusion body myositis is a rare and progressive neurodegenerative disease that has a prevalence of five to nine cases per one million adults. This disorder has a chronic progressive course that affects both proximal and distal muscles and is resistant to treatment with immunosuppression, plasmapheresis, and steroid treatment. Dysphagia is relatively rare in this disorder and its exact mechanism is unknown, however, its impact on the quality of life for individuals with inclusion body myositis is crippling. The majority of these individuals fail medical treatment for the management of their dysphagia. Recently, there has been promise for definitive surgical treatment of dysphagia in inclusion body myositis by removing the one of the cricopharyngeal muscles. Our goal is to describe the exact surgical technique of a cricopharyngeal myotomy

**Methods:** Description of surgical technique for cricopharyngeal myotomy.



**Results:** Immediately post-operatively, patients were able to be started on a clear liquid diet which they tolerated well. There were advanced to a soft diet which they also tolerated.

**Conclusions:** The exact mechanism by which dysphagia occurs in patients with inclusion body myositis is not well understood. The theory is that there is hypertrophy of the cricopharyngeal muscle causing difficulty swallowing or there is dysynchrony between the two cricopharyngeal muscles. Removing one of the cricopharyngeal muscles may eliminate this dysynchrony and allow normal swallowing.

#### **Intralobar Pulmonary Sequestration: From Primary Care to Operating Room**

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**Introduction/Objective:** While intralobar pulmonary sequestration (ILS), a pathology characterized by non functional pulmonary tissue which shares lung pleura, is relatively uncommon, it is an important, treatable cause of recurrent pulmonary infections in young adults. The presentation of pulmonary sequestration is typically in the neonatal or infant period, those who go undiagnosed can present with complication of the aberrant lung tissue, including hemorrhage or infections. Many patients with ILS will present to their primary care physicians with recurrent respiratory infections, and often, it is with imaging done for the workup of the infections that the diagnosis is determined. With appropriate imaging, it is clear the arterial supply of the ILS tissue coming from the aorta. Once it is clear the underlying lung anatomy responsible for the recurrent infections, resection of the affected lung can typically be performed.

**Cases:** The two cases to be discussed demonstrate the likely presentation of ILS. A 34-year-old woman and 45 year-old man present to their family practice doctors, respectively, for recurrent pulmonary infections which are responsive to antibiotics. On imaging obtained during the workup of their infections by their primary doctors, they are found to have consolidation versus mass in the left lower lungs, on chest x-ray. CT scans were obtained for both patients and they evidenced solid tissue with blood direct from the aorta in both cases, although the male patient had two vessels from the aorta. The preliminary diagnosis of ILS was made and the patient were referred to a thoracic surgeon who took the patients to the OR for VATS wedge resection of the lesions. On biopsy, both were confirmed to be ILS with complete resection of the affected lung tissue. Both patients did well post operatively and were discharged on post-operative day two to three.

**Discussion:** While an uncommon reason for patients to present to their physicians or the hospital with recurrent pulmonary infections, intralobar pulmonary sequestration, once diagnosed, must be resected to treat the patients. ILS has the potential for significant deleterious effects in patients, and must be recognized, and treated appropriately. It is important to keep in mind this potential cause of pulmonary infections, and despite the fact that

surgeons typically do not see patients as the first line in this algorithm, they have the capacity to greatly enhance care for their patients by knowing about pulmonary sequestrations and its treatment.

#### **Banding as an Alternative Treatment Therapy for Bleeding after Transrectal Prostate Biopsy: A Novel Technique**

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**Introduction:** Prostate cancer is the second most common cancer among males with a lifetime risk of approximately 1 in 7, or 14%. Clinicians are determining the need for prostate biopsies on a case-by-case basis after a thorough history and physical, as a dedicated screening protocol currently does not exist. Transrectal ultrasonography (TRUS)-guided prostate biopsies are the most common technique utilized to obtain prostatic tissue when there is concern for malignancy. The major complication rate is low but includes urinary retention and severe rectal bleeding, which occasionally requires operative intervention.

**Case:** The patient is a 64-year old male who had undergone an in-office transrectal prostate biopsy earlier that day. He was experiencing intermittent rectal bleeding and had a near-syncope event for which he was transported to the emergency department by ambulance. Vital signs and laboratory results were unremarkable. Bedside anoscopy was performed and a large amount of clot was evacuated. A band was placed at the bleeding site and the patient was observed for several hours without additional rectal bleeding. The patient was discharged home in stable condition and reported no further bleeding at his follow-up visit.

**Discussion:** TRUS-guided prostate biopsies are commonly performed in-office procedures using local anesthetic blocks. The complication rate varies but some studies have quoted a complication rate greater than 60%. Fortunately, most of these complications are self-limiting and include hematospermia, erectile dysfunction, and infection, as well as transient hematuria and/or rectal bleeding. However, rectal bleeding can persist and become severe, requiring operative intervention in approximately 1% of patients. In addition to supportive care including blood transfusions, methods used to achieve hemostasis include endoscopic techniques with local epinephrine injections, endoclipping, and thermocoagulation, as well as surgical techniques, such as suture ligation. While these methods are proven effective, they require an operating room setting with anesthesia. Banding can be performed at bedside by an experienced colorectal surgeon or gastroenterologist with little to no discomfort and is generally well tolerated. A review of the literature revealed minimal published data about banding as a method for hemostatic control after transrectal prostate biopsies.

**Conclusion:** TRUS-guided prostate biopsies are commonly performed office procedures in patients with a suspicion for prostate cancer. When complications do occur, they are usually minor and self-limiting. However, there are some patients that will require an intervention to control

bleeding. Although a large comparative study is needed, we have demonstrated that banding can be a safe and effective option in patients that experience persistent rectal bleeding.

**Male Knowledge Of His Partner's Contraceptive Method And Likelihood Of Fathering A Pregnancy**

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**Introduction:** Many forms of contraception are female-dependent and may not be evident to sexual partners. Less than half of men who are sexually active but do not want to father a child have partners who consistently use contraception (1). This study examines whether male knowledge of his partner's birth control method is associated with having impregnated a partner.

**Methods:** We used data from the 2011-2013 National Surveys of Family Growth. Our sample included sexually active men 15-45 years of age who had never been married. Unadjusted t-tests and linear regression assessed whether knowledge of his last partner's birth control method was associated with having fathered a pregnancy.

**Results:** Our sample included 1,845 males. 477 (25.85%) had fathered a pregnancy. At last sexual intercourse, 45.20% (n=834) reported that their partner used female-dependent contraception, defined as a contraceptive method other than male condoms, withdrawal or male sterilization. 49.70% (n=917) reported that their partner did not use female-dependent contraception, and 5.09% (n=94) did not know what contraception, if any, their partner used. There were no significant differences in rates of having fathered a pregnancy in unadjusted comparisons between groups. When adjusting for age, number of sexual partners, use of male-dependent contraception, and knowledge of contraception prior to first sex there remained no statistically significant association between male's knowledge of his partner's contraceptive method and having fathered a pregnancy.

**Conclusion/Implications:** Among unmarried men, knowledge of a current partner's contraceptive method is not significantly associated with having fathered a pregnancy.

1. Marcell AV, Gibbs SE, Choiriyah I, Sonenstein FL, Astone NM, Pleck JH, Dariotis JK. National Needs of Family Planning Among US Men Aged 15 to 44 Years. *Am J Public Health.* 2016 Apr;106(4):733-9.

**The Truly Extra-Anatomical Bypass: The Ethical Pitfalls Surrounding Futility Of Care Diagnoses Exemplified By An Extraordinary Case Report**

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**Case:** A 76 year-old male vasculopath presented to the Emergency Department with a unique and dramatic complaint; a 2cm segment of a previously placed synthetic femoral-popliteal artery bypass graft spit out through a groin wound. Except for some mild erythema surrounding the wound the patient was entirely stable without evidence of hemorrhage or purulence.

Five years previously the patient had undergone femoral-popliteal artery bypass for acute limb ischemia, however the graft occluded within two years resulting in necrosis and gangrene of the distal extremity. The patients' comorbidities included severe peripheral vascular disease, coronary artery disease with remote myocardial infarction, and debilitating Parkinson's disease. Given the operative risk, the decision was made to perform an above-the-knee amputation with simple ligation rather complete explantation of the graft. Shortly thereafter the patient entered Hospice care with instructions for comfort care measures only.

The remnant graft subsequently eroded through the skin. Vascular surgery consultation concluded that the remnant graft was occluded at its origin and, given the patients' progressive and profound co-morbidities, comfort-care measures only was appropriate. The patient was returned to Hospice care only to be returned a short time later for re-evaluation with the insistence that some intervention be performed. What is the ethical course of action?

1. Rescind the DNR order and attempt definitive surgical repair.
2. Recommend less invasive care such as local wound exploration and IV antibiotics.
3. Uphold the DNR order and return the patient to Hospice care without additional intervention.
4. Request and Ethics Committee consult.

**Discussion:** This case presents an ethical dilemma frequently confronting physicians of all specialties; how to balance our professional obligation to refrain from endorsing futile care while also appeasing our patients, they're families, and sometimes even our own colleagues desire for intervention, regardless of how impractical.

Hospice status alone does not necessarily preclude treatment. As with all proposed interventions, providers must establish a clear benefit for the patient [1]. These benefits may include but are not limited to restoration of function, improved quality of life, symptom relief, or prolongation of life [2]. The Hospice patient does, however, present unique ethical challenges in this regard. Prolongation of life as a primary goal, for example, may contradict our commitment to patient beneficence in the setting of terminal disease.

This necessarily leads to a discussion of futility of care, a deceptively innocuous term with broad medical, legal and ethical ramifications. In the past, consensus on the very definition of futility has been elusive due in part to the unique subjectivity imparted by individual patients and providers. Nevertheless, experts on the topic have found agreement. Helft et al. noted that despite operating independent of one another, multiple institutions adopted remarkably similar definitions and policies regarding futility of care. These policies were created by reviewing "putative cases of non-beneficial treatment, which would include talking to patients and families...second opinions,

consultation with specialists, and review by an institutional ethics committee [3].” This gained legal traction with the Texas Advance Directives Act of 1999, which allowed for physicians to stop futile treatments without liability, though critics argued this only encouraged the practice. In response to this, tertiary care centers in Texas adopted an ethics review process involving a committee of experts through which patients’ advocates could appeal decisions of futility. In addition, the hope was that this encourages physicians to exercise clinical judgment and discontinue futile interventions. Despite this, legal cases regarding futility in care remains common, typically pitting the treating physician against his or her own patients’ family. Physicians can find legal safety by arguing that, in the setting of terminal illness and futility of care, the principle of patients’ beneficence is best served through comfortable death versus a prolonged suffering [4]. Disputes often arise, however, when a patients’ family disagree on where individual and institutional interests lay, and can manifest as withholding consent for treatment.

**Conclusion:** In the case presented here, the decision was made to return to the operating for complete explantation of the graft followed by a prolonged course of intravenous antibiotics. This was principally due to pressure applied by the Hospice staff and, by extension, the patents’ family. While the remaining clinical course was unremarkable, review and debate of the case has lead the authors to

conclude that the appropriate course of action would have been to abide by the principles of futility of care and refuse invasive interventions.

As in all cases such as this, the concept of futility relies upon the ethical principles of autonomy and beneficence [5]. Beneficence demands that the practitioner place the welfare of the patient paramount, particularly when there are questions regarding physiologic benefits, restoration of a patient’s ability to interact with the environment, clinical status, or imminent death. Likewise, the principle of autonomy dictates that physicians the patient’s decisions to both accept as well as refuse treatment options.

**References**

1. Jecker, N. (2014, March 14). Medical Futility. Retrieved April 15, 2017, from <https://depts.washington.edu/bioethx/topics/futil.htmlHgjf>
2. Grant, S. B., Modi, P. K., & Singer, E. A. (2014). Futility and the Care of Surgical Patients: Ethical Dilemmas. *World Journal of Surgery*, 38(7), 1631-1637. doi:10.1007/s00268-014-2592-1
3. Helft, P. R., Siegler, M. & Lantos, J. The rise and fall of the futility movement. *N. Engl. J. Med.* 343, 293–296 (2000).
4. Trotochaud, K. (2006). CE: “Medically futile” treatments require more than going to court. *The Case Manager*, 17(3), 60-64. doi:10.1016/j.casemgr.2006.04.009
5. Clark, P. A. (2007). Medical Futility: Legal and Ethical Analysis. *ViAmerican Medical Association Journal of Ethics*, 9(5), 375-383. doi:10.1001/virtualmentor.2007.9.5.msoc1-0705