

THE SIXTH ANNUAL STARS
(SURGICAL TRAINEES ADVANCING RESEARCH SYMPOSIUM)

Thursday Nite Dinner with the Stars

Featuring Keynote Presentation and “Quickshots” from surgical trainees. April 12th, 2018 from 5:30 – 8PM. Auditorium F

Order	Time	Author	Title
1	6:03	David S. Han Geisel School of Medicine	Patient, provider, and facility factors associated with underuse of guideline recommended surveillance for high-risk non-muscle-invasive bladder cancer – A national study
2	6:10	Ravinder Kang, MD, MS	Impact of autologous blood transfusion on survival and recurrence for patients undergoing hepatectomy for colorectal cancer liver metastases
3	6:17	Abhishek Swarup, MD	The Effect of Nonoperative Management of Chronic Anal Fissure and Hemorrhoid Disease on Bowel Function Patient-Reported Outcomes
4	6:24	Brendin R. Beaulieu-Jones Geisel School of Medicine	Screening versus Staging Magnetic Resonance Imaging-Guided Core Needle Breast Biopsies: Upstage Frequency and Lesion Characteristics for High-Risk Lesions
5	6:35	Adil Haider, MD, MPH <i>Harvard Medical School and Harvard School of Public Health</i>	Enhancing Our Cultural Dexterity: The Next Step in Reducing Disparities and Providing Patient-Centered Surgical Care
6	7:45	Dan Underbakke, MD	Medicare Beneficiaries with Rectal Cancer in Regions with Lower Colorectal Surgeon Density Have Higher Rates of Abdominoperineal Resection: A Dartmouth Atlas Study
7	7:52	Annah Vollstedt, MD, MS	The use of opioids for stones and ureteral stents: Insights from an EDGE Consortium patient survey
8	7:59	Justin Zelones, MD	Independent Plastic Surgery Residents and General Surgery Board Certification
9	8:06	Sarah Carlson, MD	Recanalization of Long Chronic Total Occlusions via Retrograde Pedal Access in High-Risk Patients with Critical Limb Ischemia

Friday Morning Rising Stars Presentations

Full length presentations from Surgical Trainees. April 13th, 2018 from 6:30 – 8:30AM. Auditorium G

Order	Time	Author	Title
1	6:45	David S. Han Geisel School of Medicine	Overuse of cystoscopic surveillance among patients with low-risk non-muscle-invasive bladder cancer – A national study of patient, provider, and facility factors
2	7:00	Jesse A. Columbo, MD	Beware the Negative Stress Test: Postoperative Cardiac Events May Be More Prevalent Than in Patients Without a Preoperative Workup
3	7:15	Spencer W. Trooboff, MD, MBA	Understanding the Black Box: The Role of Specialist Intensity and Surgical Utilization in Accountable Care Organization Performance
4	7:30	Ryland Stucke, MD	The surgical consult EPA: Defining competence as a basis for evaluation
5	7:45	Peter Kahng Geisel School of Medicine	Testing the Efficacy of Intraoperative Imaging for Trans-Oral Surgery
6	8:00	Shaun Cooper Geisel School of Medicine	Tea consumption and the risk of squamous cell and early-onset basal cell skin cancer in a case-control study
7	8:15	Erin D’Agostino Geisel School of Medicine	Mechanisms of functional improvement in deep brain stimulation to restore visuospatial learning in a mouse traumatic brain injury model: A pilot study

Co-Directors: Philip P. Goodney, MD MS; Kari Rosenkranz, MD
Prizes: \$500 / \$250 / \$100 / \$100 (1st/2nd/3rd, Quickshot Award)
Judges: Christina Angeles, MD; Philip P. Goodney, MD MS; Adil Haider, MD MPH;
Srinivas J. Ivatury, MD MHA; Frank Penna, MD; Kari Rosenkranz, MD; Sandra L. Wong, MD MS

Patient, provider, and facility factors associated with underuse of guideline recommended surveillance for high-risk non-muscle-invasive bladder cancer – A national study

David S. Han¹, Amanda R. Swanton², Kristine E. Lynch⁴, Ji Won Chang⁴, Brenda Sirovich^{1,5}, Douglas J. Robertson^{1,5}, John D. Seigne^{2,3}, Philip P. Goodney^{1,5}, and Florian R. Schroeck^{1,2,3,5}

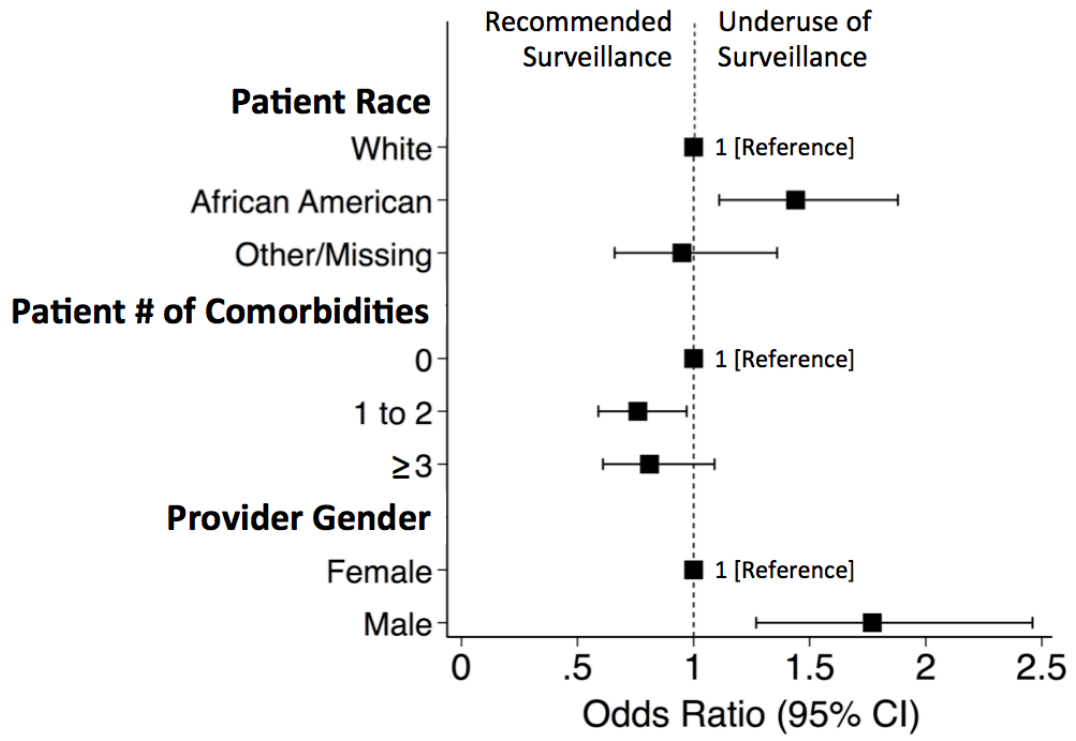
From The Dartmouth Institute for Health Policy and Clinical Practice, Geisel School of Medicine at Dartmouth College¹, Section of Urology² and Norris Cotton Cancer Center³, Dartmouth Hitchcock Medical Center, Lebanon, NH; VA Salt Lake City Health Care System and the Division of Epidemiology, University of Utah, Salt Lake City, UT;⁴ and the White River Junction VA Medical Center, White River Junction, VT⁵

Introduction: Patients with high-risk non-muscle-invasive bladder cancer (NMIBC) are at high risk for recurrence and disease progression. Thus, guidelines indicate these patients should undergo cystoscopic surveillance at least every 4 months during the first 2 years after diagnosis. We hypothesized that actual practice differs from these standards and sought to assess patient, provider, and facility factors associated with surveillance underuse.

Methods: We used administrative and pathology data abstracted via a validated natural language processing algorithm to select patients newly diagnosed with high-risk NMIBC between 2005 and 2011 from the Department of Veterans Affairs (VA). Patients were followed until cancer recurrence, death, date of last VA encounter, or 2 years after diagnosis. Procedure codes were used to enumerate the number of cystoscopies during follow-up. Surveillance underuse was defined as cystoscopy less frequent than every 4 months. We identified patient, provider, and facility variables associated with underuse using multivariable generalized estimating equations.

Results: Of 2,070 patients included, 651 (31%) received cystoscopy less frequently than every 4 months. Only 3 factors were associated with surveillance underuse: African American race (OR 1.44, 95% CI: 1.11–1.88), no comorbidity (vs. 1 to 2 comorbidities with OR 0.76, 95% CI: 0.59–0.97), and male provider gender (OR 1.77, 95% CI: 1.27–2.46) (Figure). Patients' year of diagnosis, age, sex, household income, and rural residence, as well as provider type (resident, attending, advanced practice provider) and age were not associated with underuse. No facility factors (size, rurality, complexity, number of urologists) were associated with underuse.

Conclusions: One third of patients with high-risk NMIBC do not receive recommended surveillance. The patient and provider factors associated with underuse suggest some systematic differences in surveillance, but reasons for these differences are not immediately clear. We will need qualitative research to assess barriers to surveillance not readily captured in administrative data.



Impact of autologous blood transfusion on survival and recurrence for patients undergoing hepatectomy for colorectal cancer liver metastases

Ravinder Kang, M.D., M.S.^{1,2,3}; Bronte E. Seath B.S.³; Viola Huang M.D.¹; Richard J. Barth Jr., M.D.^{1,3}

1 Department of Surgery, Dartmouth Hitchcock Medical Center, Lebanon, New Hampshire

2. VA Outcomes Group, Veterans Health Association, White River Junction, Vermont

3. Geisel School of Medicine at Dartmouth, Hanover, New Hampshire

Introduction: Blood transfusion during a liver resection for colorectal cancer metastases is common. Allogenic-transfusions are associated with immunomodulation and increased risk of recurrence. While autologous-transfusion is an alternative, it is also associated with a theoretical risk of spreading metastatic disease. It was the objective of this study to evaluate the risk of recurrence and overall survival among patients who received an autologous-transfusion compared to patients who did not receive a transfusion.

Methods: A retrospective chart-review was performed for all patients who underwent a liver resection for colorectal metastases at a single academic institution between 1999 and 2016. Kaplan-Meier curves were constructed for overall survival and recurrence free survival (RFS) at 10 years. A multivariable Cox regression analysis was performed adjusting for age, sex, Fong Clinical Risk Score, extent of resection and blood loss to study overall survival and RFS.

Results: 67 received an autologous-transfusion and 73 patients received no-transfusion. Those who received a transfusion had greater blood loss, larger surgical resections, and longer procedures. There was no statistical difference in age, sex, proportion colon vs rectal cancer or Fong score. Median follow-up was 43 months.

During the study 35 patients in the autologous-transfusion group and 37 patients in the no-transfusion group died. The overall survival in the two groups was similar ($p=0.65$, log-rank test, *Figure 1A*). On adjusted Cox regression, the hazard ratio (autologous vs no-transfusion) for overall mortality was 0.53 (95% confidence interval (CI): 0.28-1.01; $p = 0.052$). RFS was also similar in the two groups ($p=0.24$, log-rank test, *Figure 1B*). The adjusted hazard ratio for RFS was 1.00 (95% CI: 0.57-1.75; $P = 0.99$).

Conclusions: Autologous blood transfusion is not associated with an increased recurrence risk or higher mortality rate. Surgeons performing liver resections for patients with colorectal cancer metastases can safely transfuse filtered autologous blood.

Figure 1A: Overall survival following liver resection for colorectal cancer metastasis, stratified by receipt of autologous transfusion or no transfusion.

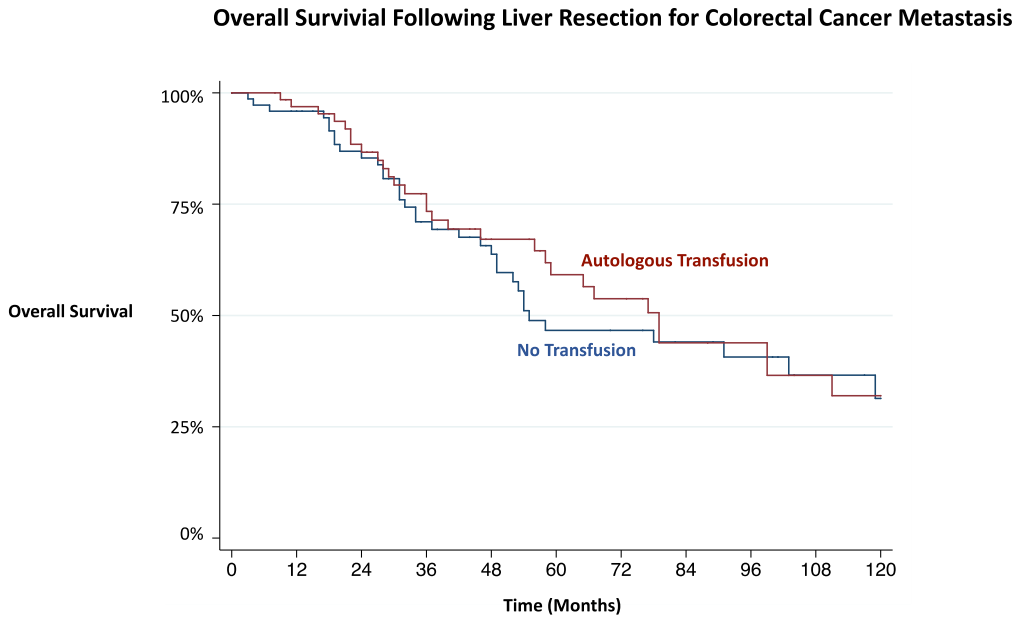
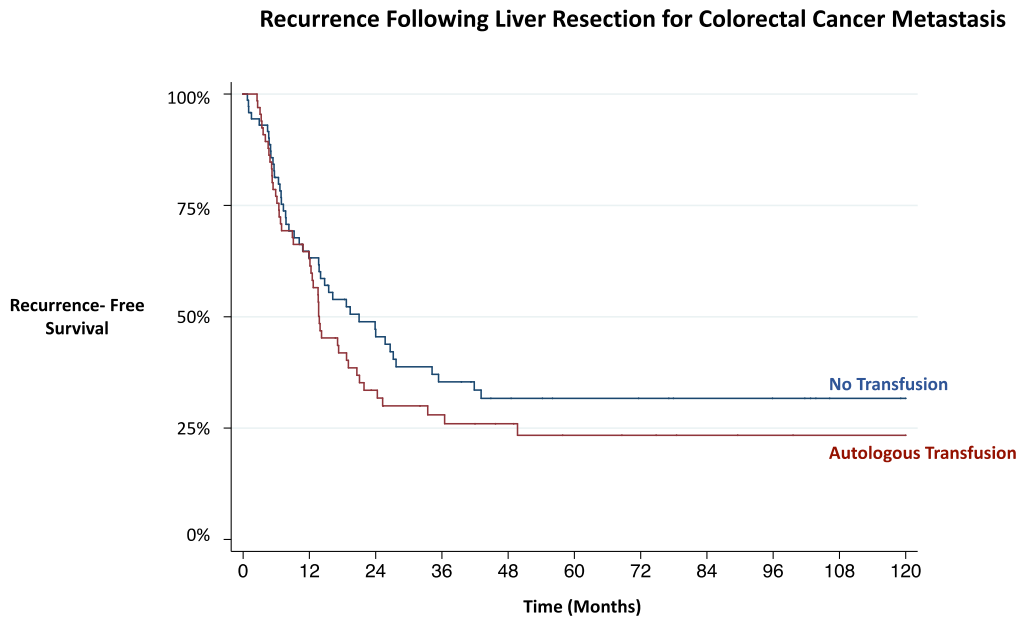


Figure 1B: Recurrence following liver resection for colorectal cancer metastasis, stratified by receipt of autologous transfusion or no transfusion.



The Effect of Nonoperative Management of Chronic Anal Fissure and Hemorrhoid Disease on Bowel Function Patient-Reported Outcomes

Abhishek Swarup, Srinivas J. Ivatury

BACKGROUND

Common anorectal diseases are associated with significant patient complaints. Chronic anal fissure and hemorrhoid disease can be managed with medical and surgical means. We sought to evaluate the effectiveness of dietary modification and medical therapy on bowel function patient-reported outcomes for these diseases.

METHODS

All patients evaluated for chronic anal fissure (CAF) and hemorrhoid disease (HD) from May 2015 to May 2017 were eligible for analysis. Disease processes were analyzed together and separately. Standardized dietary counseling including use of a fiber supplement was performed on all patients; those with fissures were also prescribed topical calcium channel blockers. The COREFO questionnaire was administered prospectively to patients during the initial visit and at the follow-up. The questionnaire assesses bowel function in five domains and provides a total score; scores for each range from 0 (best function) to 100 (poorest function). We proposed a null hypothesis that there would be no improvement in bowel functional outcomes. Demographic and questionnaire results were linked and analyzed. Paired t-test analysis was used to evaluate the score changes at the time of follow-up.

RESULTS

37 (58%) patients were treated for CAF and 27 (42%) were treated for HD. Mean age was 52±15 years. Table 1 shows the outcomes. There was a significant improvement in three domain scores at follow-up: incontinence, stool-related aspects, and social impact. Total COREFO score was significantly improved at follow-up for the aggregate group. When analyzed separately, CAF had an improvement in the total score and the same domains as the main cohort whereas HD had an improvement in the total score and the same domains except for social impact.

CONCLUSION

Medical management for chronic anal fissures and hemorrhoid disease significantly improves global bowel function as well as multiple functional domains. Dietary counseling and medical therapy should be the first line outpatient therapy for these diseases.

Table 1 – Bowel Functional Outcomes Scores

	Mean (SD) Score at Initial Visit	Mean (SD) Score at Follow Up	p
Frequency	9.5 (12.3)	8.8 (9.1)	NS
Incontinence	15.7 (14.5)	12.0 (12.1)	<0.05
Medication	31.2 (27.9)	33.1 (27.7)	NS
Social Impact	26.4 (20.6)	20.5 (20.9)	<0.05
Stool Related Aspects	56.4 (29.3)	39.5 (29.4)	<0.05
Total COREFO Score	25.2 (14.3)	20.3 (14.0)	<0.05

Screening versus Staging Magnetic Resonance Imaging-Guided Core Needle Breast Biopsies: Upstage Frequency and Lesion Characteristics for High-Risk Lesions with Associated Atypia

Brendin R. Beaulieu-Jones, Natalie Ring, Tracy Frazee, Roberta M. DiFlorio-Alexander, Kari M. Rosenkranz

Background/objective: The latest recommendations from the American Cancer Society, the American College of Radiology and the Society of Breast Imaging support annual breast magnetic resonance imaging (MRI) screening for high-risk patients (>20% lifetime) as well ipsilateral staging and contralateral screening for patients with known malignancy. MRI has higher sensitivity than mammogram and ultrasound, which may lead to an increased number of biopsies and an increased incidence of pathology atypical lesions. The aim of this study was to investigate whether the malignancy upstage frequency for high-risk lesions (atypical ductal hyperplasia (ADH), atypical lobular hyperplasia (ALH) and lobular carcinoma in situ (LCIS)) identified via MRI-guided core breast biopsies varied based on indication: high-risk screening versus malignancy staging.

Methods: A retrospective review of all MRI-guided core needle breast biopsies performed at a single institution from January 2006 to June 2017 was completed. Patient demographics, MRI features, histopathologic findings from core biopsy and excisional pathology were assessed. Statistical analysis (descriptive statistics and two-way, two-sample T-tests) were performed.

Results: A total of 399 MRI-guided biopsies were performed (19 diagnostic, 126 high-risk screening, 128 contralateral screening and 126 ipsilateral staging), and 47 (11.8%) high-risk lesions (ADH, ALH, LCIS) were observed. Surgical excision pathology was available and attributed to core biopsy site for 36 of 47 high-risk lesions. Nine of thirty-six lesions (25.0%) were upstaged to invasive malignancy or ductal carcinoma in situ (DCIS). More than one-third (4/9) of lesions found during ipsilateral staging were upstaged, though this was not significant. No differences were found in the upstage rate by histologic type, MRI indication, lesion size or past history of breast cancer.

Conclusion: High-risk lesions with atypia identified via MRI-guided core biopsies were associated with an upstage rate to malignancy of 25.0%. No variation was observed by indication. As adoption of breast MRI continues, further evaluation of the upstage rate by indication will be critical to inform the risks and benefits of surgical excision of ADH, ALH, and LCIS.

Table 1 – Upstage Rate by Histologic and Imaging Characteristics

Characteristic	Upstaged to Malignancy		Unable to Classify ¹	T-test P-value
	Yes	No		
Total (n=47)	9	27	11	
Histologic Type²				
ADH (n=15)	2	7	6	0.42
ALH (n=24)	6	12	6	0.13
LCIS (n=20)	6	12	2	0.13
Indication for breast MRI				
High-risk screening (n=9) ³	1	7	1	0.18
Ipsilateral staging (n=17) ⁴	4	9	4	0.28
Contralateral screening (21) ⁵	4	11	6	0.43
MRI lesion (cm)				
<1 (n=20)	2	12	6	0.12
≥1 (n=27)	7	15	5	
Prior history of breast cancer				
Yes (n=8)	1	6	1	0.24
No (n=39)	8	21	10	

Two-sample, two-way T-tests were performed using STATA, p-value <0.005

ADH = Atypical ductal hyperplasia; ALH = Atypical lobular hyperplasia; LCIS= lobular carcinoma in situ

¹Excisional pathology was not available for 11 high-risk lesions: no surgery secondary to patient preference, failed biopsy and excisional site matching and transfer of care to another institution

²Histologic classifications are not exclusive; 14/47 high-risk lesions met criteria for multiple classifications

³High-risk screening refers to patients undergoing breast MRI screening secondary to high lifetime risk (>20%) for development of breast cancer, as consistent with the latest recommendations by the American Cancer Society, the American College of Radiology and the Society of Breast Imaging

⁴Ipsilateral staging refers to comprehensive MRI assessment of a breast with proven malignancy

⁵Contralateral screening is a component of our institution's breast cancer staging protocol and refers to MRI screening of the contralateral breast in patients with pathology proven malignancy

5. Keynote



Adil Haider, MD, MPH
Kessler Director, Center for Surgery and Public Health

Enhancing Our Cultural Dexterity: The Next Step in Reducing Disparities and Providing Patient-Centered Surgical Care

Bio

Adil Haider, MD, MPH, FACS is an active trauma and acute care surgeon, prolific researcher, and the Kessler Director for the Center for Surgery and Public Health (CSPH), a joint initiative of Brigham and Women's Hospital, Harvard Medical School, and the Harvard T.H. Chan School of Public Health. He is also the Deputy Editor of JAMA Surgery and holds numerous leadership positions, including President of the Association for Academic Surgery (AAS). Dr. Haider is credited with uncovering racial disparities after traumatic injury and establishing the field of trauma disparities research. He is regarded as one of the foremost experts on healthcare inequities in the United States, with projects focused on describing and mitigating unequal outcomes based on gender, race, sexual orientation, ethnicity, age and socioeconomic status. His other research focuses on long-term clinical and functional outcomes after trauma and emergency general surgery, optimal treatment of trauma/critically ill patients in resource-poor settings, and advanced analytic techniques for surgical health services research. He has formally mentored more than 100 research trainees, published more than 250 peer reviewed papers and currently serves as Principal Investigator (PI) on extramural grants worth more than ten million dollars. He is the recipient of numerous awards, including the 2017 Ellis Island Medal of Honor. Dr. Haider believes that equality is the cornerstone of medicine, and his professional goal is to eradicate disparities in healthcare in the United States.

Medicare Beneficiaries with Rectal Cancer in Regions with Lower Colorectal Surgeon Density Have Higher Rates of Abdominoperineal Resection: A Dartmouth Atlas Study

Daniel Underbakke MD; Ravinder Kang MD, MS; Srinivas Ivatury MD, MHA

INTRODUCTION: There has been increased enthusiasm for restorative reconstruction after proctectomy for rectal cancer in appropriate candidates. Despite this, abdominoperineal resection (APR) remains common. This study examines how the density of colorectal surgeons in a hospital referral region (HRR) affects the rate of APRs performed.

METHODS: Using the Dartmouth Atlas Rate Generator, we queried the cohort of 2014 Medicare beneficiaries for rectal cancer (ICD-9: 154.1) with APR (CPT: 45110 or 45395). We examined rates of APR per beneficiaries in each of the 306 HRRs. We compared APR rates per HRR by the density of active, board-certified colorectal surgeons in 2014 per HRR (divided into low, medium, and high density HRRs) using certification data from the American Board of Colon and Rectal Surgery. A test of trend was performed on the rates of APRs by surgeon density.

RESULTS: 1,821 beneficiaries underwent APR for rectal cancer in 2014. The national rate of APR per 100,000 beneficiaries was 6.57. Individual APR rates were available for 46 HRRs (those with >10 procedures/year) comprising 42.4% of the total. Figure 1 demonstrates the trend of decreasing rates of APR in HRRs with greater colorectal surgeon density. The average rates of APRs per 100,000 in the low, medium, and high density groups were 8.82, 7.84, and 6.72 respectively, p-trend 0.09.

CONCLUSION: A higher density of board-certified colorectal surgeons is associated with decreased rates of APR in Medicare beneficiaries. We are examining if this trend correlates with restorative reconstruction.

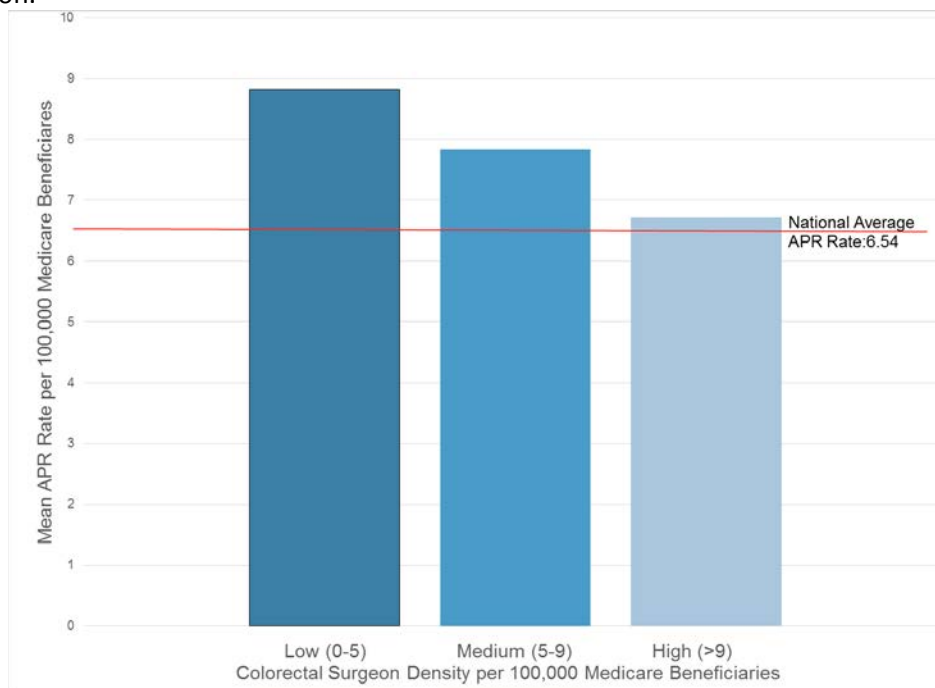


Figure 1: Mean rates of abdominoperineal resections per 100,000 Medicare beneficiaries versus density of colorectal surgeons in each of 46 hospital referral regions grouped into categories low, medium, and high

The use of opioids for stones and ureteral stents: Insights from an EDGE Consortium patient survey

Annah J. Vollstedt, Vernon Pais

Introduction

With the spotlight on the nation's opioid crisis, urologists should analyze the use of opioids both for management of urological conditions, as well as the surgical interventions used to treat them. We sought to investigate the use of opioids during acute episodes of urolithiasis and after urologic surgery in which a stent was placed post-operatively.

Methods

A previously-validated survey assessing impact quality of life and use of opioid pain medication was distributed to patients with a history of ureteral stent at seven academic centers between July 2016 and September 2017.

Results

A total of 249 surveys were completed. Most patients (75%, 186/249) used an opioid at some point during either their stone episode or for stent-related pain. 61% (151/249) of patients used opioid pain medication for stone pain, versus 39% (98/249) who used opioids for stent-related pain. Patients with increased number of prior stone episodes were more likely to use opioids for their most recent episode ($p < 0.001$). Younger patients were more likely to use opioids for stent pain ($p < 0.001$). This held true when accounting for sex, patient-perceived health status, and the number of prior stone episodes. When assessing whether patients used more opioids for stent-related pain or stone pain, 40% reported using more opioids for stone episode than for stent-related pain, while 16% reported using more opioids for the stent-related pain. Only 10% (25/249) patients required opioids only for the stent-related pain and not the stone pain.

Conclusions

Ureteral stents have been shown to be associated with a decreased quality of life, our study shows that the use of opioids for stent-related pain is less than that for stone pain. Younger patients are less likely to tolerate a stent without opioid analgesics. Such findings may help target those for whom more aggressive opioid-alternative strategies should be developed.

Independent Plastic Surgery Residents and General Surgery Board Certification

Justin T. Zelones MD, Gregory S. Hanson MPH, and Joseph H. Shin MD

PURPOSE: Most independent plastic surgery residents have completed a general surgery residency. The decision to attempt certification in general surgery is multifactorial. The purpose of this study is to assist independent plastic surgery residents in their decision to attempt board certification in general surgery.

METHODS: An email was sent to each US plastic surgery program asking them to distribute an anonymous online survey to their current independent residents. The questionnaire was developed to obtain data regarding resident sociodemographics, training program characteristics, and in-training/American Board of Surgery (ABS) examination history.

RESULTS: A total of 33 current independent plastic surgery residents completed the questionnaire. Residents were divided into 2 groups: ABS Certified and Not Certified. Female residents, Midwest programs, 5+ chief residents, and plastic surgery in-training scores >65th percentile were associated with being certified. Most residents took the ABS qualifying/certifying exams with pass rates of 93.3% and 87.5% respectively. Reasons cited not to attempt exams include financial issues, time away from training, travel burden, and no plans on practicing general surgery. Reasons cited to attempt exam was feelings of obligation to general surgery program and to become board certified.

CONCLUSIONS: The majority of independent plastic surgery residents become board certified in general surgery. Rationales for residents to attempt the ABS exam can aid others in their decision to become board certified. Further information regarding the benefits of board certification and re-certification among plastic surgeons is warranted.

Recanalization of Long Chronic Total Occlusions via Retrograde Pedal Access in High-Risk Patients with Critical Limb Ischemia

Carlson SJ, Suckow BD, Stone DS, Goodney PP, Powell RJ, Stableford JA, Spangler EL, Nolan BW

Introduction

Critical limb ischemia (CLI) patients with long femoral-popliteal chronic total occlusions (CTOs) and limited bypass options face significant amputation risk. Retrograde pedal access (RPA) has been previously described as a technique for endovascular treatment of tibial disease. We describe our experience with recanalization of long segment femoral-popliteal occlusions via RPA in high-risk CLI patients.

Methods

All patients undergoing attempted RPA for lower extremity revascularization over 2 years at our institution were analyzed. A subset of patients with CLI and TASC C or D fem-pop CTOs who were not bypass candidates (due to failed prior revascularizations, excessive comorbidities, and/or no autologous conduit) were analyzed for this study. Demographic, hemodynamic, and procedural data were collected. Outcomes were major adverse events (death, myocardial infarction, acute renal failure, major pulmonary events, wound complications, and access vessel thrombosis), length of stay, limb salvage, and patency.

Results

Twenty-six patients underwent endovascular interventions via RPA (22 for CLI, 4 for claudication). Mean follow-up was 286 days (range 4-593). Eighteen patients with CLI underwent recanalization of a TASC C or D fem-pop CTO. These were relatively young, mean age 64 years, with significant comorbidities: 39% prior CABG/PCI, 35% chronic renal insufficiency, 62% diabetic, and 39% prior failed lower extremity bypass and/or PVI. Ninety-four percent of these procedures were performed under general anesthesia. In 50% of cases, pedal access was achieved percutaneously under ultrasound guidance. Fifty-six percent of patients had a concomitant femoral endarterectomy. All CTO patients were treated with stents / stent grafts after femoral popliteal atherectomy (17%) or subintimal PTA (83%). The median treatment length was 350 mm. Median procedure time was 227 minutes. There were 8 endovascular reinterventions during follow up at a mean of 125 days. Key procedural and 270-day event rates are summarized below (Table 1).

Conclusion

Retrograde pedal access (RPA) offers a viable technical alternative for treatment of TASC C and D fem-pop CTOs in high-risk CLI patients. Relatively high rates of technical success with significant hemodynamic improvement can be achieved with a low MAE rate, short hospital LOS, and good short-term limb salvage. Re-interventions are common, highlighting the need for close surveillance and further assessment of long-term durability.

Table 1

Pre / post op ABI	MAE	LOS (median/range)	Freedom from amputation	Primary patency	Secondary patency
0.28 / 0.85	33%	2 / 1 to 28	63%	62%	78%

Rising Stars

Full length Presentations

Friday, April 13, 2018

1. Han, D

Overuse of cystoscopic surveillance among patients with low-risk non-muscle-invasive bladder cancer – A national study of patient, provider, and facility factors

David S. Han¹, Amanda R. Swanton², Kristine E. Lynch⁴, Ji Won Chang⁴, Brenda Sirovich^{1,5}, Douglas J. Robertson^{1,5}, John D. Seigne^{2,3}, Philip P. Goodney^{1,5}, and Florian R. Schroeck^{1,2,3,5}

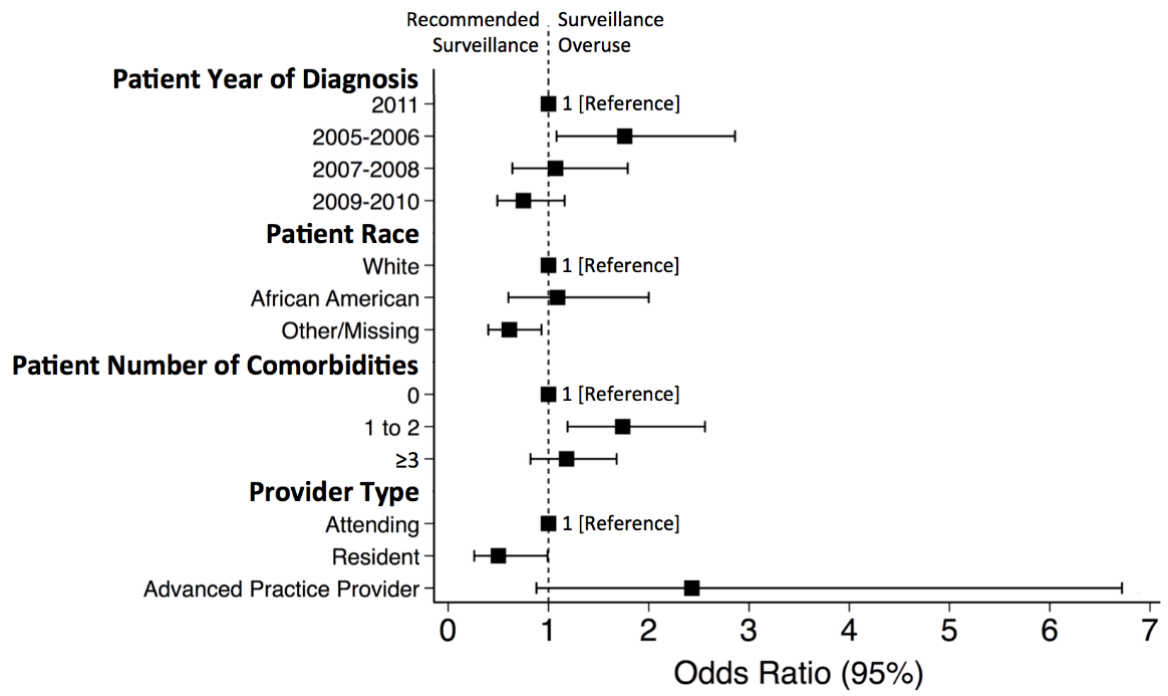
From The Dartmouth Institute for Health Policy and Clinical Practice, Geisel School of Medicine at Dartmouth College¹, Section of Urology² and Norris Cotton Cancer Center³, Dartmouth Hitchcock Medical Center, Lebanon, NH; VA Salt Lake City Health Care System and the Division of Epidemiology, University of Utah, Salt Lake City, UT;⁴ and the White River Junction VA Medical Center, White River Junction, VT⁵

Introduction: Since 2005, multiple panels have recommended no more than 3 cystoscopies in the first two years after diagnosis for patients with low-risk non-muscle-invasive bladder cancer (NMIBC). We hypothesized that – despite recommendations – many patients receive too much cystoscopic surveillance. We sought to understand the extent of overuse and to examine patient, provider, and facility factors contributing to it.

Methods: Using a validated natural language processing algorithm, we included patients newly diagnosed with low-risk NMIBC at the Department of Veterans Affairs (VA) from 2005 to 2011. Patients were followed until cancer recurrence, death, date of last VA encounter, or 2 years after diagnosis. Procedure codes were used to enumerate the number of cystoscopies during follow-up. Overuse of cystoscopic surveillance was defined as >1 cystoscopy if followed less than 1 year, >2 cystoscopies if followed 1 to less than 2 years, or >3 cystoscopies if followed for 2 years after diagnosis. We identified patient, provider, and facility factors associated with overuse using multivariable generalized estimating equations.

Results: We found overuse of cystoscopy among 75% of patients (905 of 1,206). Of 14 factors assessed, few were associated with overuse: earlier year of diagnosis (OR 1.76, 95% CI: 1.08–2.86), white race (vs. other/missing with OR 0.61, 95% CI: 0.40–0.93), 1 to 2 comorbidities (OR 1.74, 95% CI: 1.19–2.56), and attending provider (vs. resident with OR 0.50, 95% CI: 0.26–0.99) (Figure). Other patient (age, sex, household income, rural residence), provider (age, gender), and facility factors (size, rurality, complexity, number of urologists) were not associated with overuse.

Conclusion: Overuse of cystoscopy among patients with low-risk NMIBC is common, raising concerns about costs and quality of bladder cancer surveillance. However, few patient and provider factors were associated with overuse. Further qualitative research may identify other determinants of overuse not captured in administrative data.



Beware the Negative Stress Test: Postoperative Cardiac Events May Be More Prevalent Than in Patients Without a Preoperative Workup

Jesse A Columbo, Ravinder Kang, Douglas W Jones, Bjoern D Suckow, Daniel B Walsh, Richard J Powell, Philip P Goodney, David H Stone

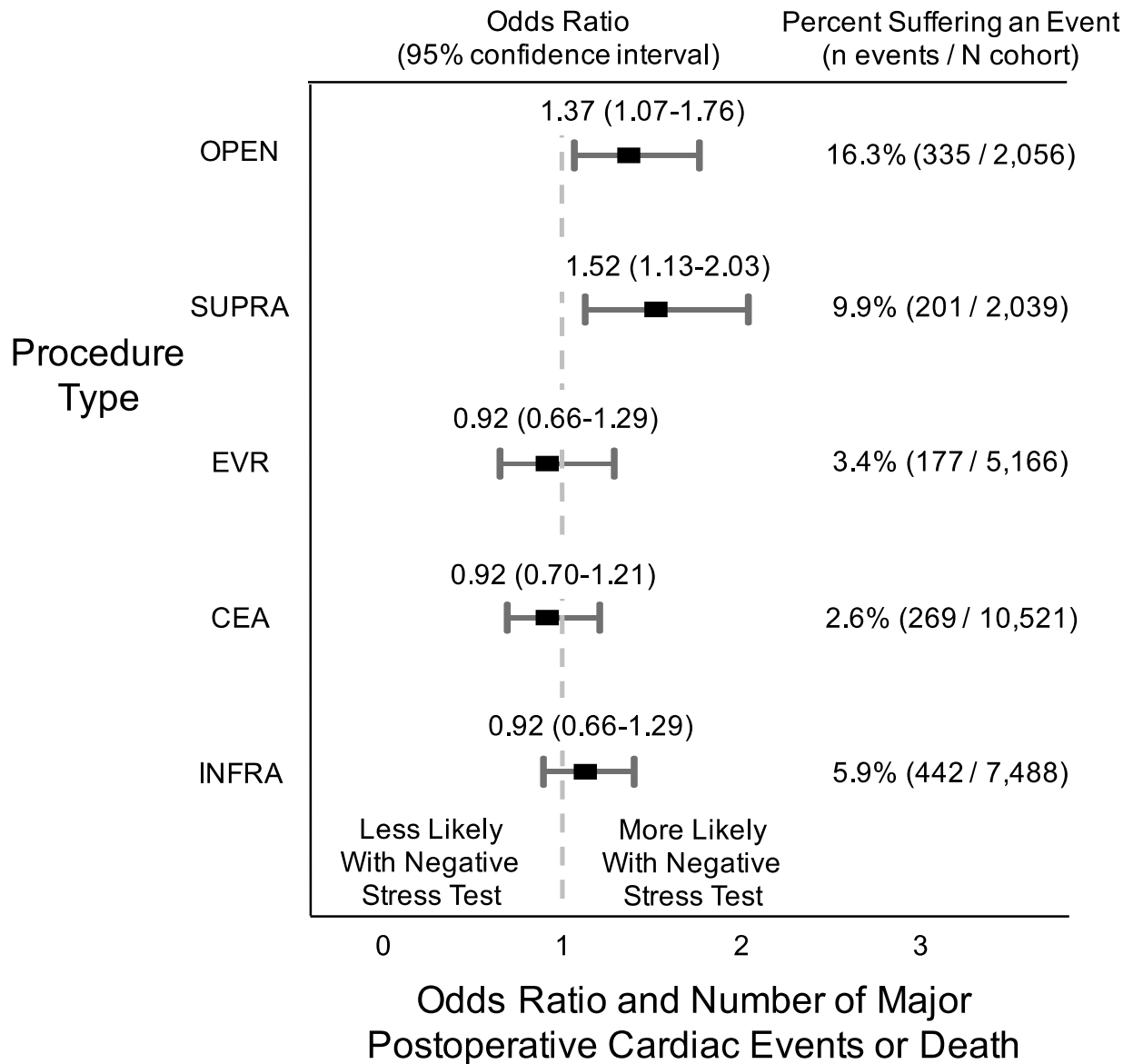
Background: Patients thought to be at elevated perioperative risk are often selected to undergo stress testing prior to vascular surgery. The objective of this study was to compare the incidence of postoperative cardiac events among patients with negative stress tests versus those who did not undergo testing.

Methods: We reviewed all patients who underwent elective open abdominal aortic aneurysm repair (OPEN), suprainguinal bypass (SUPRA), endovascular aneurysm repair (EVR), carotid endarterectomy (CEA), and infrainguinal bypass (INFRA) within the Vascular Study Group of New England (VSGNE) from 2003-2017. Next, we excluded patients with positive stress tests ($n=3,312$), and studied two mutually exclusive groups: elective surgery patients with a negative stress test, and elective surgery with no stress test (total $n=27,270$). The primary outcome was a composite of in-hospital postoperative cardiac events (dysrhythmia, heart attack, heart failure) or death.

Results: A preoperative stress test was obtained in 66.3% of OPEN, 42.8% of SUPRA, 37.1% of EVR, 36.0% of CEA, and 31.2% of INFRA. The crude odds ratio (OR) of in-hospital postoperative cardiac event or death was 1.37 (95% confidence interval (CI): 1.07-1.76) for OPEN, and 1.52 (CI: 1.13-2.03) for SUPRA, indicating that patients with negative stress tests prior to these procedures were 37% and 52% more likely to suffer a postoperative event or die compared to patients selected to proceed directly to surgery without testing (Figure). Conversely, the crude OR was 0.92 (CI: 0.66-1.29) for EVR, 0.92 (CI 0.70-1.21) for CEA, and 1.13 (0.90-1.40) for INFRA, indicating that patients undergoing these procedures had a similar likelihood of an event, whether they had a negative stress test or proceeded directly to surgery without a stress test. Adjustment for age, sex, and comorbidities did not meaningfully change these estimates.

Conclusions: Patients are often appropriately selected to proceed directly to surgery within the VSGNE. However, a negative preoperative stress test must not assuage the concern for an adverse outcome, as these patients retain a substantial likelihood of cardiac events, especially after large magnitude procedures.

Figure: Crude Odds Ratios of Major In-Hospital Postoperative Cardiac Event or Death for Patients who had a Negative Stress Test versus Those who Did not Undergo Stress Testing



Legend: OPEN; open abdominal aortic aneurysm repair; SUPRA, suprainguinal bypass; EVAR, endovascular aortic aneurysm repair; CEA, carotid endarterectomy; INFRA, infrainguinal bypass.

3. Trooboff, S

Understanding the Black Box: The Role of Specialist Intensity and Surgical Utilization in Accountable Care Organization Performance

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Introduction

The success of Accountable Care Organizations (ACO) depends on the ability to provide high-quality care at lower cost. Surgeons and other specialists advantaged by traditional fee-for-service models may influence increased healthcare expenditures in ACOs. There are little data to inform healthcare systems on the optimal role of surgeons in ACOs.

Methods

We examined ACOs in the Medicare Shared Savings Program using the 2016 Performance Year Public Use File. The primary exposure was specialist intensity (specialists per 1,000 ACO beneficiaries). The primary outcome was savings per beneficiary (risk-adjusted benchmark expenditures minus actual beneficiary expenditures). We also examined the relationship of ACO savings with state-level surgical utilization (surgical discharges per 1,000 Medicare beneficiaries) via Dartmouth Atlas of Health Care data.

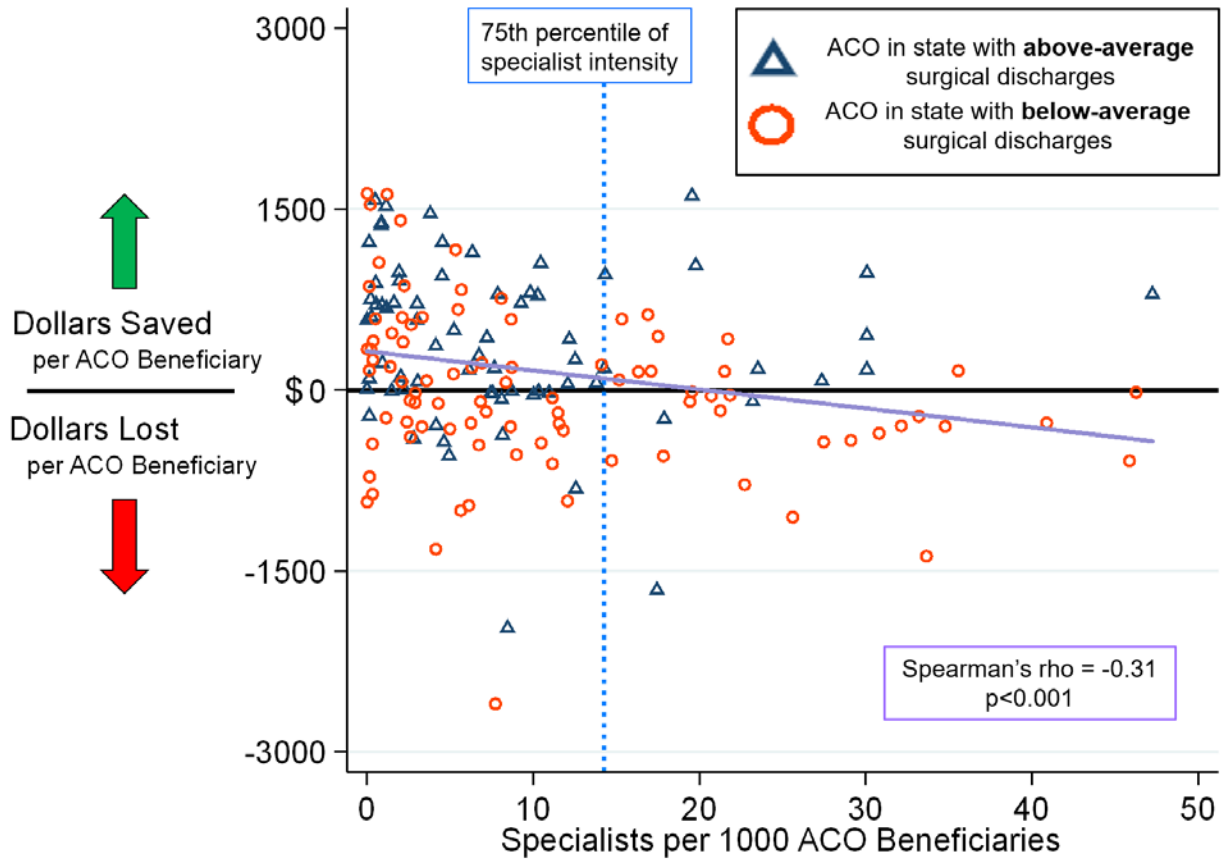
Results

There were 161 ACOs with ≥ 3 years of performance data covering 3.1 million beneficiaries in 33 states. Specialist intensity ranged from 0-46 specialists per 1000 ACO beneficiaries (median=6.7, IQR 2.1-14.3 specialists) and mean savings ranged from -\$1,974 to \$1,624 per ACO beneficiary (mean \$163 \pm \$699). ACOs with higher specialist intensity were less likely to achieve shared savings ($r=-0.31$, $p<0.001$) (**Figure**). However, across levels of specialist intensity, ACOs in states with above-average surgical utilization achieved more shared savings per beneficiary than ACOs in states with below-average surgical utilization (\$318 vs -\$136, $p<0.001$).

Conclusions

ACO with more specialists per attributed beneficiary have been less likely to achieve shared savings. Better ACO performance in states with higher surgical utilization is unexpected, suggesting that some high value specialty services may facilitate shared savings.

Figure. Relationship between ACO specialist intensity and savings per ACO beneficiary stratified by state-level rate of surgical discharges relative to the national average



The surgical consult EPA: Defining competence as a basis for evaluation

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Introduction

The American Board of Surgery has proposed a residency redesign, which relies on entrustable professional activities (EPAs) to assess and document competence. No data exist to define competence for surgical consultation, one of five proposed trial EPAs.

Methods

Cognitive task analysis and semi-structured interviews were performed with 14 senior teaching faculty at two academic institutions. Thematic saturation was achieved after 5 interviews. Interview content was independently reviewed and coded by 2 surgical researchers for procedural steps and performance themes.

Results

Table 1. 6 procedural steps were identified with key themes for each:

<u>Procedural step</u>	<u>Key themes</u>
1. Receiving information	<ul style="list-style-type: none">• triage consult urgency• review existing data
2. Bedside evaluation	<ul style="list-style-type: none">• history/physical exam• obtain pertinent social details/patient preferences
3. Obtain additional information	<ul style="list-style-type: none">• initial differential diagnosis• obtain additional tests/diagnostics
4. Decision making	<ul style="list-style-type: none">• final diagnosis• action plan/recommendations
5. Communication	<ul style="list-style-type: none">• closed loop communication to all stakeholders• concise/organized presentation to attending
6. Documentation	<ul style="list-style-type: none">• thorough with clear/complete recommendations• finished in a timely manner

No agreement existed for which step requires the most cognitive skill. No explicit framework was routinely used to assess resident competence. 12 of the 14 surgeons said, "I just know competence when I see it". Faculty commonly used knowledge of prior resident performance when assessing the consult at hand.

Competent or developing residents were differentiated by common performance traits including: 1. ability to triage urgency of consult with respect to other service demands, 2. thoroughness and thoughtfulness, 3. ability to incorporate extenuating circumstances, 4. ability to proceed when uncertainty exists, 5. comfort synthesizing and editing clinical details, and 6. developing a safe plan

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within acceptable practice standards. Agreement of a resident and attending final plan was not important to determine competence if the other factors were met.

A consult attempt was deemed a “failure” if any of the following were displayed: 1. lying/deception, 2. missing critical details of the evaluation, work-up, or presentation, 3. refusing to see the consult, and 4. rudeness/disrespect.

Conclusions

A competent consultation includes 6 key procedural steps and multiple performance traits involving interpersonal, psychosocial, clinical, and administrative skills. No framework currently exists to evaluate competence. Further data will allow for creation of a consult evaluation tool, which can be used to establish EPA standards for consultation.

5. Kahng, P

Testing the Efficacy of Intraoperative Imaging for Trans-Oral Surgery

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Background: Trans-oral surgery (TOS) is effective in managing malignancies of the pharynx and larynx. This “inside-out” approach, however, is limited by the inability to intraoperatively assess submucosal tumor extent. Surgical navigation through intraoperative image-guidance has reduced morbidity in neurosurgery and sinus surgery but has not been explored in TOS as preoperative imaging does not reflect the patient’s anatomic deformation during TOS. In this study, we utilize a 3D printed CT-compatible laryngoscope to acquire intraoperative images to assess improvement in target localization accuracy.

Methods: Fiducials were placed submucosally in four cadaver heads. Neck CT scans were obtained in repose as “preoperative” CT scans (PO). An “intraoperative” neck CT scan (IO) was then acquired with a CT-compatible laryngoscope placed in rigid suspension. Otolaryngology surgeons were tasked to localize five fiducials using pins based on sequential review of PO and IO CT images during suspension laryngoscopy.

Results: Participants placed 124 matching pairs of pins. Mean target localization error (TLE) decreased from 12.8 ± 9.9 mm to 10 ± 7.6 mm from PO-to-IO ($p < .001$), with reduction in TLE by 2.1 ± 6.2 mm and 3.6 ± 6.9 mm for faculty and resident surgeons ($p < .01$, $p < .01$), respectively. Subgroup analysis for left, midline, and right base of tongue (BOT) and vallecula revealed a TLE reduction by 1.7 ± 6.7 mm ($p < .01$). Analysis of right-sided structures that were most exposed by scope positioning revealed a PO-to-IO reduction in TLE from 15.5 ± 11.4 mm to 10.7 ± 8.7 mm, ($p < .001$). Use of IO reduced task completion time by 26% when compared to PO ($p < 0.001$).

Conclusions: Use of intraoperative imaging in cadaver models simulating TOS resulted in significant improvements in target localization and task completion times, regardless of experience level. These findings suggest that development of a surgical navigation system utilizing intraoperative imaging or deformation modeling of the intraoperative state may improve surgical accuracy, safety, and efficacy in TOS.

Tea consumption and the risk of squamous cell and early-onset basal cell skin cancer in a case-control study

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INTRODUCTION:

Tea is a rich source of polyphenols, which have putative antioxidant effects and are hypothesized to confer cutaneous anti-tumor benefits, as demonstrated by *in-vitro* studies and mouse models. However, whether tea consumption protects against the occurrence of keratinocyte carcinomas has not yet been conclusively determined in epidemiologic studies.

OBJECTIVE:

We explored the effects of tea consumption on the risk of developing cutaneous squamous cell carcinoma (SCC) and early-onset basal cell carcinoma (EOBCC) as part of a population-based case-control study in New Hampshire.

METHODS:

Detailed patterns of tea consumption (e. g., type of tea, quantity, brewing time, additives) were collected through personal interviews with 456 individuals with histologically-confirmed SCC, 327 with histologically-confirmed EOBCC, and 745 age- and sex-matched controls.

RESULTS:

After adjusting for potential confounders (age, sex, number of painful sunburns, and skin type), the odds of developing SCC were reduced in individuals who regularly consumed >2-3 cups of hot tea daily compared to those who did not drink tea (adjusted OR 0.42, 95% CI = 0.19-0.92), but not of EOBCC.

LIMITATIONS:

Our observational study design leaves open the possibility of recall bias and residual confounding.

CONCLUSIONS:

Our findings suggest that regular hot tea consumption may reduce the risk of developing SCC, but not EOBCC.

Mechanisms of functional improvement in deep brain stimulation to restore visuospatial learning in a mouse traumatic brain injury model: A pilot study

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Introduction: Deep Brain Stimulation (DBS) has been posited as a treatment for Traumatic Brain Injury (TBI), which affects approximately 1% of the US population. The purpose of this study was to utilize a mouse model of TBI to evaluate the effect of DBS in the Nucleus Accumbens (NAc) on visuospatial learning.

Methods: 14 C57BL/6 mice underwent stereotactic controlled cortical impact, followed by implant of either a sham or electrical stimulation probe in the NAc. Mice were then tested in a Morris Water Maze for 12 days, 4 trials per day, with a maximum of 60 seconds of search time per trial. The experimental group received 20 seconds of NAc stimulation once on the platform. Latency to platform and platform finding success rate were recorded and analyzed as they related to day, swimming ability, and group (sham vs. stimulation).

Results: 8 mice (6 sham and 2 stimulation) met inclusion criteria. All mice demonstrated improved visuospatial learning, with the likelihood of finding the platform significantly associated with day of testing ($P=0.000$). As a whole group mice found the platform in 12.5% of trials on day 1, 53.1% of trials on day 6, and 87.5% of trials on day 12. Chi2 analysis revealed that NAc stimulation was significantly associated with success in platform finding (Fisher's exact= .023). Multivariate logistical analysis revealed that the variation in likelihood of platform finding was explained by poor swimming ability ($p=0.000$, coefficient 2.03, SE .566), day ($p=0.000$, coefficient -.3087, SE .041) and group ($p=0.090$, coefficient= -.4951, SE .292).

Conclusion: Acknowledging the limitation of a small sample size, it appears that DBS in the NAc of mice with TBI has some effect on facilitating visuospatial learning. This effect is modified by gross motor ability, likely secondary to variation in extent of cortical injury.