

The 2nd Annual

# R. Daniel Beauchamp Research Day

*Strengthening the culture of research in the Section of Surgical Sciences*



**April 10, 2026**

.....  
*Build visibility of research ▪ Inspire new research ▪ Build connections ▪ Career development for junior faculty and residents*

*Sponsored by the Section of Surgical Sciences*

VANDERBILT  HEALTH

**R. Daniel Beauchamp, MD**, was the J.C. Foshee Distinguished Professor of Surgery, Professor of Cell and Developmental Biology, and co-Leader of the Gastrointestinal Cancer Program.

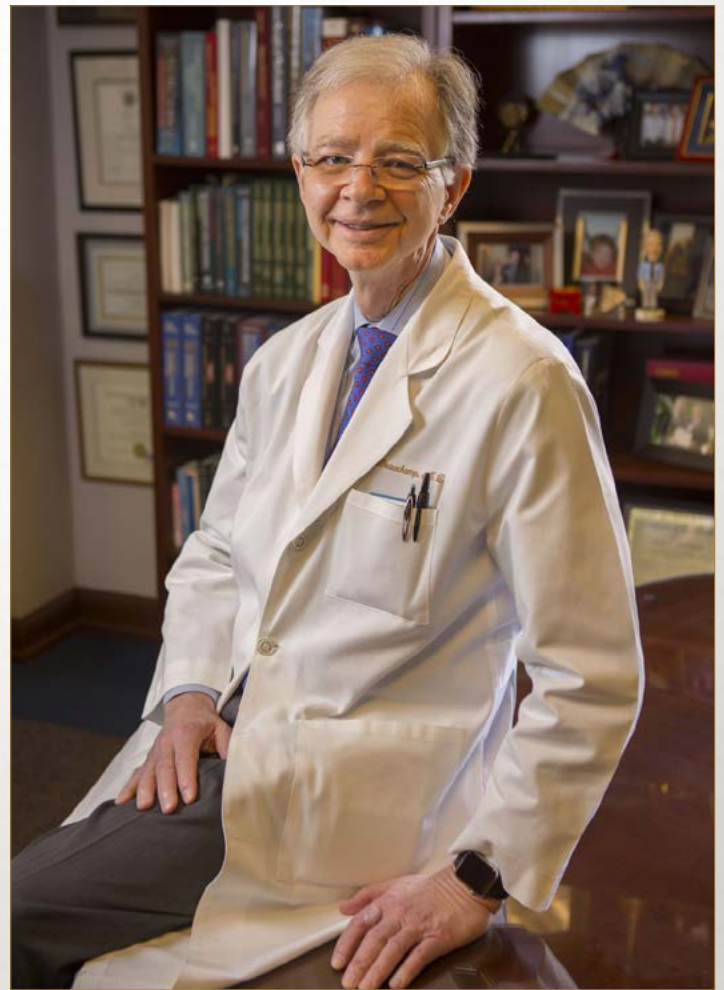
Dr. Beauchamp served as Chair of the Section of Surgical Sciences and Surgeon-in-Chief of Vanderbilt University Medical Center from July 2001 through June 2018. He also served as Deputy Director of the Vanderbilt-Ingram Cancer Center from 2011-2019. In July 2018, Dr. Beauchamp assumed the role of Vice President for Cancer Center Network Affairs until 2021.

Dr. Beauchamp completed medical school (1982) and General Surgery residency (1987) at the University of Texas Medical Branch in Galveston. After residency, he received research fellowship training with Dr. Harold L. Moses in the department of Cell Biology at Vanderbilt University. Dr. Beauchamp returned to UTMB as assistant professor in Surgery where he remained for 5 years before he was recruited back to Vanderbilt in 1994 to join the Department of Surgery. He was appointed the first chief of the Division of Surgical Oncology and Endocrine Surgery at VUMC and named the John L. Sawyers, MD, Professor of Surgery in 1997.

Under Dr. Beauchamp, the Section strengthened its national reputation for innovation and advancing surgical care. During his tenure as Chair, Beauchamp pushed the Section into the Top 10 in funding from the National Institutes of Health. He worked tirelessly to recruit strong leaders, advance the Section's research and training programs and increase faculty diversity. Dr. Beauchamp's focus was always on strengthening the quality, depth and breadth of our surgical programs so that our patients would benefit. His emphasis on encouraging and promoting an environment where research and innovation can flourish resulted in numerous new surgical offerings, many of which continue to set national standards and make VUMC a sought after regional and national destination for patients with complex conditions.

Dr. Beauchamp's laboratory received continuous funding by the National Institutes of Health for over 25 years. He authored over 160 peer-reviewed publications and numerous book chapters and

reviews. He presented work across the US, and in Canada, Europe and Asia. He served as Associate Editor for the Sabiston Textbook of Surgery, 16th-21st editions, and served on the editorial boards of *Surgery*, the *American Journal of Surgery*, the *Journal of the American College of Surgeons* and numerous others. His awards include election to American Society for Clinical Investigation, the National Academy of Medicine, Fellowship in the American Association for the Advancement of Sciences, the American Surgical Association Flance-Karl Award for Scientific Achievement and the Sheen Award from the American College of Surgeons and Bank of America. He received the Frank Boehm Award for Excellence in Teaching Continuing Medical Education at Vanderbilt University. Since 1989, he trained and mentored dozens of residents in Surgery and over 55 research fellows and students.



# Keynote Speaker

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## *“Targeting the Microbiome to Promote Health and End Cancer”*

### **Jennifer Wargo, MD, MMSc**

*R. Lee Clark Endowed Professor  
Departments of Surgical Oncology & Genomic Medicine  
Founder and Leader, Platform for Innovative Microbiome and  
Translational Research  
The University of Texas MD Anderson Cancer Center  
Member, National Academy of Medicine*

**Jennifer A. Wargo, MD, MMSc**, is an internationally recognized physician-scientist whose career has been dedicated to advancing the understanding and treatment of cancer through innovative translational research. With a profound commitment to bridging science and patient care, Dr. Wargo’s work has fundamentally reshaped approaches to cancer therapy, setting new paradigms in the fields of immunotherapy, targeted therapy, and microbiome research.

Dr. Wargo earned her medical degree and completed surgical residency training at Massachusetts General Hospital (MGH), where she developed a keen interest in cancer biology and therapy. During her training, she completed two fellowships in surgical oncology with a focus on cancer immunotherapy, laying the foundation for her impactful career. In 2008, she was recruited to join the faculty in the Division of Surgical Oncology at MGH, where she established a translational research laboratory aimed at understanding response and resistance to treatment in melanoma, pancreatic cancer, and other malignancies. Her pioneering work during this time demonstrated that molecularly targeted therapy could sensitize tumor cells to immunotherapy, providing a scientific rationale for combining these treatment modalities—a strategy now being evaluated in clinical trials with promising outcomes.

In 2013, Dr. Wargo was recruited to the University of Texas MD Anderson Cancer Center to help lead the institution’s Melanoma Moonshot efforts. Today, she serves as a Professor of Surgical Oncology and Genomic Medicine and leads the Platform for Innovative Microbiome and Translational Research (PRIME-TR). Her groundbreaking research continues to focus on enhancing cancer therapies through targeted therapy, immunotherapy, and modulation of the gut and tumor microbiome. Recognized globally for her discoveries, Dr. Wargo has made paradigm- and practice-changing contributions to understanding how the microbiome influences cancer treatment responses. Her team’s work has shown that diet, particularly a high-fiber intake, and strategies modulating gut microbes can improve patient outcomes—insights that have spurred new clinical trials and opened an entirely new field of research.

# Keynote Speaker

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Throughout her career, Dr. Wargo has identified novel biomarkers and therapeutic targets that have been widely published in leading journals such as *Nature*, *Nature Medicine*, *Science*, *Cell*, *Cancer Discovery*, and *Lancet Oncology*. She pioneered the use of neoadjuvant targeted therapy and immune checkpoint blockade in melanoma and other cancers and cofounded the International Neoadjuvant Melanoma Consortium to further collaborative progress in the field.

Dr. Wargo's contributions to understanding the immune effects of targeted therapy, especially in melanoma, have been instrumental in defining mechanisms of treatment resistance and developing strategies to overcome them. Early in her career, she co-authored seminal papers that identified resistance mechanisms to BRAF-targeted therapies, and she led efforts to collect longitudinal tumor biopsies and blood samples for deep molecular analyses—work that enabled the discovery of numerous resistance pathways and informed new therapeutic strategies.

As a dedicated collaborator and inspirational servant leader, Dr. Wargo is deeply committed to working with investigators across disciplines and around the world to develop innovative strategies to treat, intercept, and ultimately prevent cancer. Her visionary research continues to push the boundaries of cancer science, improving the lives of patients.

# Schedule of Events

Time	What	Where
7:00 - 8:00 A.M.	Keynote Speaker - Jennifer A. Wargo, MD, MMSc "Targeting the Microbiome to Promote Health and End Cancer"	214 Light Hall
8:00 - 10:00 A.M.	Research Day Poster Session	Langford Lobby
10:00 - 11:00 A.M.	Meeting with Research Residents Judging Panel meets to score posters and decide winners	Langford Lobby

# Acknowledgements

We would like to express our sincerest gratitude to the Section of Surgical Sciences for making this day possible, as well as our planning committee and judges.

## Research Day Planning Committee

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Dr. James Goldenring	Dr. Elisa Gordon
Dr. Alexander Hawkins	Dr. Ricky Shinall
Marjorie Tattersfield	Khristina Prince

## Poster Session Planning Committee

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Dr. Emily Breeding  
Dr. Alexander Hawkins  
Dr. Marissa Kuo  
Dr. Kevin McGann  
Dr. Meredith Monsour  
Dr. Jill Streams

## Judges

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Dr. Rachel Appelbaum	Dr. Sarah Bick
Dr. Evan Brownie	Dr. Stephen Deppen
Dr. Elisa Gordon	Dr. Eric Grogan
Dr. Tae Hyun Hwang	Dr. Andrew Medvecz
Dr. Martin Montenovov	Dr. Tiffany Nevill
Dr. Peter Reese	Dr. Jason Samuels
Dr. Kevin Sexton	Dr. Raeshell Sweeting
Dr. Marcus Tan	Dr. Anne Wagner
Dr. Andrew Well	Dr. Nicholas Zachos

# **2026 Dan Beauchamp Research Day**

## *Submitted Abstracts*

**Total Abstracts: 49**

**Basic Science/Translational Abstracts: 7**

**Clinical Outcomes/Quality Improvement Abstracts: 42**

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## **Basic & Translational Sciences**

## Abstract # 4

**Title:** Causal evidence of seizure suppression in human intracranial EEG recordings

**Authors:** C. Price Withers, Bruno Hidalgo Monroy Lerma, Ghassan S. Makhoul, Addison C. Cavender, Anas Reda, Kate Wang, Derek J. Doss, Graham W. Johnson, Chadd M. Funk, Shawniqua Williams Roberson, Robert P. Naftel, Angela N. Crudele, Sarah K. Bick, Victoria L. Morgan, Dario J. Englot

### Introduction

The Interictal Suppression Hypothesis in focal epilepsy proposes that high inward connectivity to seizure-onset zones (SOZ) is consistent with tonic inhibition at rest. Prior evidence supporting this hypothesis has focused on resting state and ictal SEEG recordings, but single-pulse electrical stimulation (SPES) may provide causal evidence of SOZ suppression and uncover optimized paradigms for neurostimulation. Therefore, we sought to evaluate the distance-dependent effects of SPES on band power in SOZs, propagation zones (PZ), and non-involved zones (NIZ).

### Methods

We analyzed 60 patients with focal DRE who underwent SPES. Stimulation trains lasted 10 seconds, consisting of 1Hz, 0.3ms biphasic pulses at 3mA. SEEG signal was bipolar montaged and filtered from 1-150Hz after stimulation artifact removal. Power was quantified from 15-315ms post-stimulation, band aggregated, and z-scored against the pre-stimulation baseline. Euclidean distance was computed between stimulation-response pairs.

### Results

We observed significant increases in theta power at response sites within 60mm of stimulated channels, with no effect on distant sites. In contrast, there were significant reductions in low gamma power at response sites >40mm away from stimulated channels, with no effect on local sites. In distance-matched stimulation response pairs, SOZ NIZ stimulation increased theta power greater than NIZ SOZ stimulation. In contrast, NIZ stimulation decreased low gamma power in SOZs and PZs in a unidirectional manner.

### Conclusions

This study presents evidence that SPES exerts both local and distant effects on band power. Whereas stimulation increased local theta activity, it decreased distant low gamma activity. Notably, we observed effects of stimulation that were specific to channel type (SOZ, PZ, or NIZ). Specifically, stimulating SOZs demonstrated greater theta increases in the NIZ than vice versa. Stimulating NIZs uniquely disrupted low gamma activity within the SOZ and PZ. Because high-frequency activity is thought to reflect neuronal firing rates, the observed decrease in low gamma activity by NIZ stimulation may be consistent with an underlying seizure suppression mechanism. This is the first study we are aware of that provides causal evidence to support the Interictal Suppression Hypothesis. We propose that these findings may be leveraged with therapeutic neurostimulation to suppress seizures.

## Abstract # 15

**Title:** Systemic Phenotypic and Functional Characterization of T-Cells Following Liver Tumor Ablation by Histotripsy

**Authors:** Marium T. Siddiqui, MD; Matthew A. Cottam, PhD; Zaid Hatem; Yunli Chu; Marcus C Tan, MBBS, FACS; Douglas B. Johnson, MD, MSCI; Mona Mashayekhi, MD, PHD; Sekhar Padmanabhan, MD, FACS, FSSO; Kamran Idrees, MD, MSCI, MMHC, FACS

### Introduction

Histotripsy is a non-invasive, non-ionizing, and non-thermal procedure for liver tumors (primary and metastases) that utilizes targeted ultrasonic waves to mechanically dissociate and liquefy targeted tumors into cellular debris. Regression of untreated (non-histotripsy) tumor lesions, known as the abscopal effect, have been observed after histotripsy in certain patients. However, the effect of histotripsy on circulating T-cells and the mechanism by which it activates the immune system remains unknown.

### Methods

Peripheral blood mononuclear cells (PBMCs) were collected prior to histotripsy (pre-histotripsy sample) and approximately 30 days after histotripsy (post-histotripsy sample). Ex vivo activation of circulating T-cells to five clinically approved immunotherapy drugs (three anti-PD1, one anti-PDL1, and one anti-CTLA4) were screened using antigen-independent T-cell activation assay. T-cell activation was defined as a response to at least one of the five immunotherapy drugs. Proteomic and flow cytometric analyses were performed to evaluate proteins, monocytes, and T-cells.

### Results

For functional, non-antigen-dependent ex vivo responses to immunotherapy, patients were divided into two groups: those with tumors from immunotherapy-approved cancers and those with microsatellite-stable colorectal cancer (MSS CRC). In patients with immunotherapy-approved cancers, the ex vivo activation rate increased from 67% to 100%, while in MSS CRC patients, activation increased from 33% to 83% post-histotripsy. Proteomic analysis revealed increased levels of proteins associated with cell damage and lipid metabolism, including TNF, APOE, GSTA1, and ACOX1. Expression of the CD36 receptor increased across monocytes, significantly in intermediate monocytes, which play a role in antigen presentation on flow cytometric analysis. In T-cells, the expression of the CXCR3 receptor on CD8+ T-cells increased significantly in the antigen-experienced subtypes which are the central memory (T<sub>cm</sub>), effector memory (T<sub>em</sub>), and terminally differentiated effector memory (T<sub>emra</sub>).

### Conclusions

This study suggests that histotripsy enhances ex vivo T-cell activation to immunotherapy. Proteomic and flow cytometry data indicate that liquefied lysate from tumor destruction releases lipids and chemokines leading to increased recruitment of antigen-presenting intermediate monocytes and antigen-experienced CD8+ T-cells. These findings suggest that histotripsy may improve immunotherapy sensitivity across all liver tumors. Longitudinal sampling and monitoring of biochemical and radiographic responses are ongoing.

## **Abstract # 17**

**Title:** Thalamic nuclei exert selective influence on the seizure onset zone in focal epilepsy: Implications for neuromodulation therapy

**Authors:** Bruno Hidalgo Monroy Lerma, Ghassan S. Makhoul, Anas Reda, Addison C. Cavender, C. Price Withers, Kate Wang, Derek J. Doss, Chadd Funk, Graham W. Johnson, Catie Chang, Shawniqua Williams Roberson, Robert P. Naftel, Tyler Ball, Sarah K. Bick, Angela N. Crudele, Victoria L. Morgan, Dario J. Englot

### **Introduction**

Focal epilepsy is considered a network disorder where seizures emerge from dynamic interactions between the seizure onset zone (SOZ) and a broader network. The Interictal Suppression Hypothesis (ISH) proposes that distributed regions suppress the SOZ to maintain the interictal state. Although the thalamus is an important neuromodulation target for the treatment of focal epilepsy, the interictal interactions of its diversely connected nuclei with SOZs remains poorly understood. We investigated interactions between thalamic nuclei, SOZs, and non-ictogenic zones (NIZs) distributed across anatomical regions to understand whether thalamic nuclei are sources of interictal seizure suppression.

### **Methods**

We collected 20-minute interictal recordings from 35 patients with focal drug-resistant epilepsy (DRE) undergoing stereotactic EEG monitoring. Channels are anatomically labeled using the Desikan-Killiany atlas and the thalamus is segmented into nuclei using hierarchical statistical shape modeling. Electrodes are registered to MNI space to compute Euclidean distance between channels. Directed influence is computed using partial directed coherence and is z-scored relative to each patient's data across all channels.

### **Results**

Pulvinar and ventral thalamic nuclei exert significantly greater influence on the SOZ than on distance-matched NIZs in mesial temporal cortex, lateral temporal cortex, and the insula. In contrast, the influence of the centromedian nucleus on the SOZ exceeds its influence on NIZs in the lateral temporal cortex, but nowhere else. Across all nuclei, thalamic influence on the SOZ is strongest in the delta (0.5-4Hz) and gamma (30-100Hz) bands.

### **Conclusions**

The pulvinar and ventral nuclei of the thalamus selectively exert interictal influence on SOZs which is stronger than their influence on distributed NIZs equidistant from the thalamus. This interaction is strongest in the lowest and highest frequency bands and may constitute a primary source of interictal suppression. The centromedian nucleus' bias of influence toward the SOZ is least strong, likely reflecting its more diffuse projections than pulvinar and ventral nuclei's comparatively specific tractography. This work elucidates potentially suppressive interictal interactions between thalamic nuclei and SOZs, consistent with the ISH. It also suggests that pulvinar and ventral thalamic nuclei are more effective targets than the centromedian nucleus for neuromodulation therapy in focal DRE.

## Abstract # 18

**Title:** Divergent Network Dynamics Across the Consciousness Spectrum in Human Temporal Lobe Epilepsy

**Authors:** Anas Reda, Ghassan S. Makhoul, Bruno Hidalgo Monroy Lerma, Addison C. Cavender, C. Price Withers, Derek J. Doss, Graham W. Johnson, Kate Wang, Chadd Funk, Shawniqua Williams Roberson, Tyler J. Ball, Robert P. Naftel, Angela N. Crudele, Sarah K. Bick, Catie Chang, William P. Nobis, Victoria L. Morgan, and Dario J. Englot

### Introduction

Consciousness remains difficult to study because most approaches examine neural representations during full wakefulness rather than capturing network dynamics during transitions into and out of awareness. Temporal lobe epilepsy offers a unique natural experiment: focal seizures originating from the same temporal structures produce a graded consciousness spectrum, from preserved awareness to complete loss of consciousness. Whether the two unconscious states along this spectrum represent escalating severity or mechanistically distinct dynamical regimes has remained unknown.

### Methods

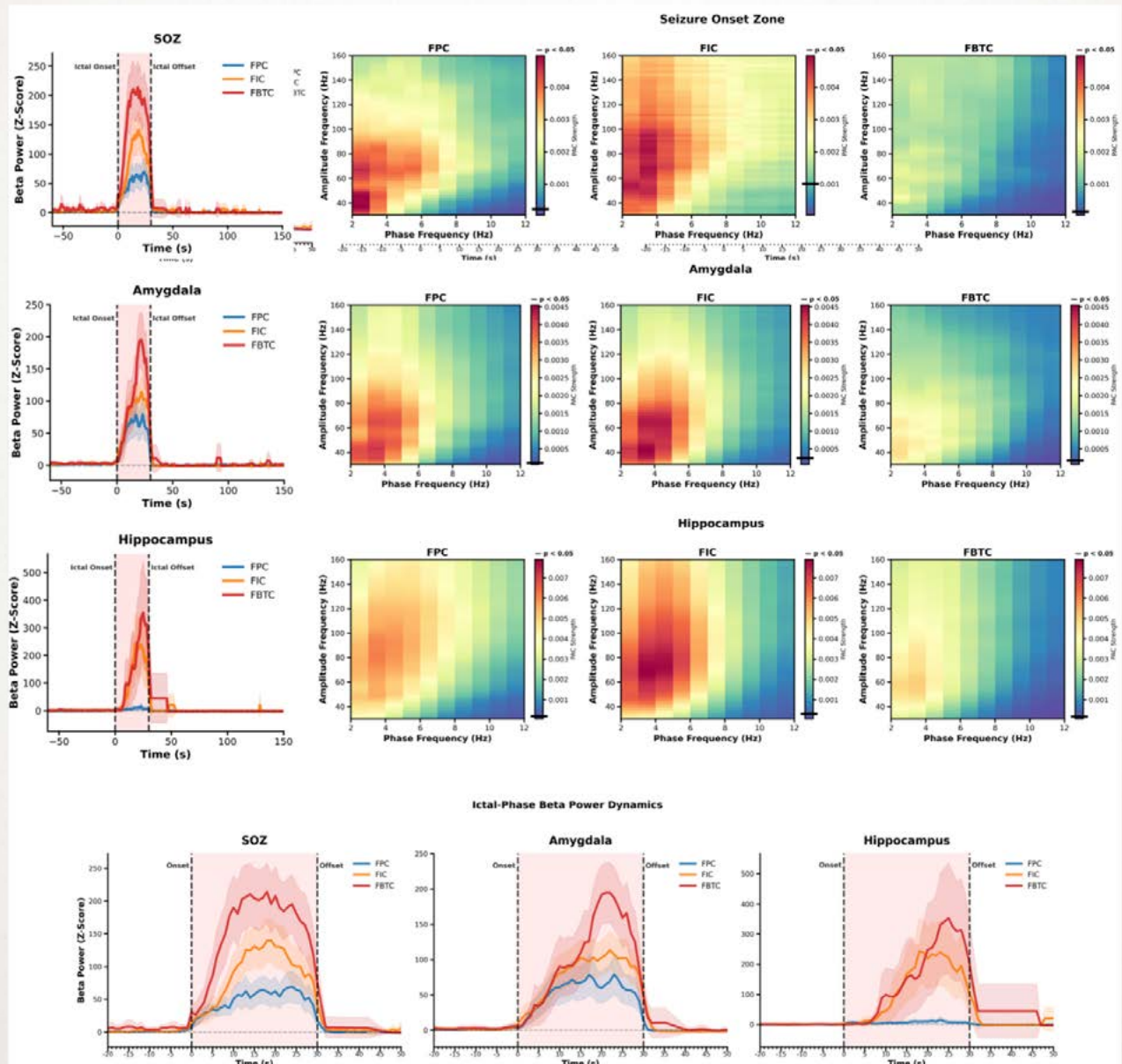
Chronic intracranial recordings from 40 drug-resistant TLE patients were analyzed across 235 seizures classified as focal preserved consciousness (FPC), focal impaired consciousness (FIC), or focal to bilateral tonic-clonic (FBTC). Spectral power and phase-amplitude coupling (PAC) were computed across seizure onset zone, mesial temporal structures, and distributed cortical regions spanning the full peri-ictal trajectory. Natural sleep recordings from the same patients provided within-subject physiological benchmarks; N2/N3 coupling contours were derived from the top 20% of sleep PAC values and applied to seizure comodulograms to quantify how much ictal coupling fell within physiological unconsciousness boundaries across 124 region-pair connections.

### Results

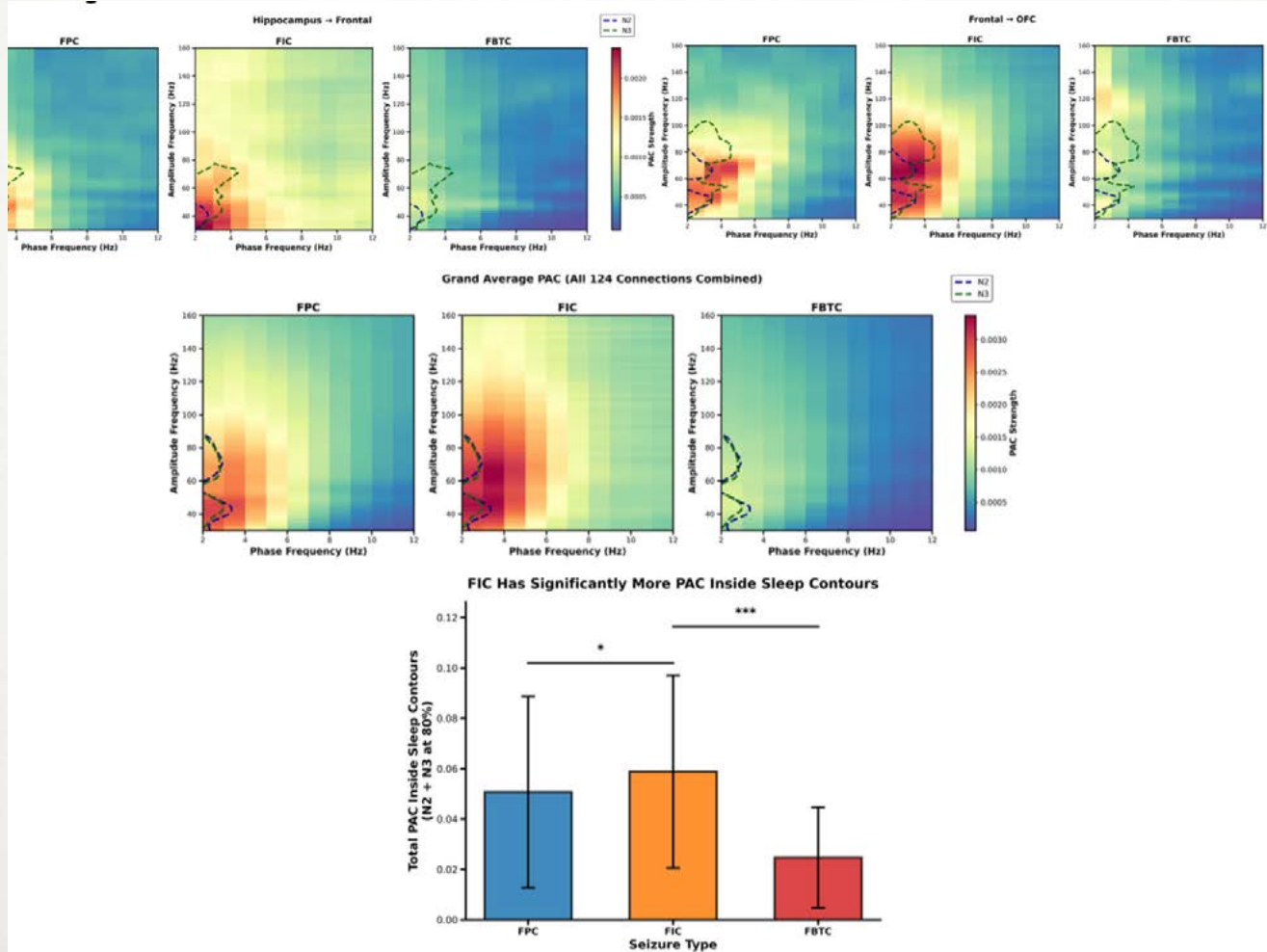
Beta power increased monotonically across the consciousness spectrum from FPC through FIC to FBTC across seizure onset zone, amygdala, and hippocampus. However, this progression masked a fundamental power-coupling dissociation: while beta power continued escalating into FBTC, PAC collapsed paradoxically by 71-75% across all mesial temporal structures despite maximal power, with comodulograms confirming broad-spectrum suppression rather than a frequency-specific shift (**Figure 1**). When N2/N3 sleep contours derived from the top 20% of each patient's own sleep PAC were applied to seizure comodulograms, FIC seizures showed significantly stronger engagement of sleep-like coupling than both FPC ( $p=0.029$ ) and FBTC ( $p<0.0001$ ), with hippocampus-to-frontal and frontal-to-OFC connections concentrating within physiological unconsciousness boundaries. FBTC showed 2.5-fold weaker sleep-like coupling than FIC despite higher power, with grand-average comodulograms falling entirely outside sleep contours (**Figure 2**).

### Conclusions

Loss of consciousness in TLE is not a unitary phenomenon. FIC achieves unconsciousness by pathologically amplifying the same coupling circuits that define physiological deep sleep, while FBTC destroys organized network dynamics entirely, producing a state outside the parameter space of any physiological brain state. This mechanistic divergence reframes how consciousness disruption should be understood, predicted, and targeted therapeutically.



**Figure 1. Power-coupling dissociation across the consciousness spectrum in mesial temporal lobe structures.** Beta power (13-30 Hz) increased monotonically from FPC through FIC to FBTC across seizure onset zone, amygdala, and hippocampus, yet phase-amplitude coupling diverged paradoxically: despite generating the highest beta power, FBTC seizures showed broad-spectrum PAC collapse across all mesial temporal regions, confirming a fundamental dissociation between neural activity and oscillatory coordination. Comodulograms show ictal PAC strength across phase (2-12 Hz) and amplitude (40-160 Hz) frequencies for each seizure type and region. Ictal-phase beta power dynamics illustrate the full peri-ictal trajectory from 20 seconds before onset through 50 seconds after offset. Shaded regions denote standard error. Only significant connections ( $p < 0.05$ ) are displayed in comodulograms.



**Figure 2. FIC seizures recruit physiological sleep-like coupling circuits while FBTC falls outside the parameter space of any physiological brain state.** N2/N3 sleep contours derived from the top 20% of each patient's own sleep PAC were applied to seizure comodulograms across 124 region-pair connections, providing a within-subject benchmark for physiological unconsciousness. Representative connections including hippocampus-to-frontal and frontal-to-OFC show FIC PAC concentrating within N2/N3 boundary contours, while FBTC coupling falls outside these boundaries despite higher overall power. Grand average comodulograms combining all 124 connections confirm this pattern across the full network. FIC exhibited significantly greater total PAC inside sleep contours than both FPC ( $p=0.029$ ) and FBTC ( $p<0.0001$ ), with 2.5-fold stronger sleep-like coupling than FBTC, indicating that FIC and FBTC achieve loss of consciousness through mechanistically distinct dynamical regimes.

## **Abstract # 22**

**Title:** Toward Minimalism: Early Experience with a Novel Wristed 3mm Surgical Robot

**Authors:** Alejandro O. Chara, Ethan Wilke, Aabhas Jain, Duke Herrell III, Irving J. Zamora, Harold N. Lovvorn III, and Robert J. Webster III

### **Introduction**

Minimally invasive surgery continues to evolve toward reduced tissue trauma and improved patient outcomes. Needlescopic instrumentation (<3mm) has demonstrated significant perioperative benefits, including decreased morbidity, reduced postoperative pain, and superior cosmetic results compared to standard laparoscopic approaches. However, current wristed robotic platforms lack the necessary miniaturization to accommodate needlescopic instruments without compromising mechanical performance. We present the preliminary experiments of a novel robotic design with full wrist articulation and grasping capability at needlescopic dimensions.

### **Methods**

Our system utilizes a curved nitinol tube housed within a stainless-steel sheath to generate multi-directional wrist articulation. The instrument incorporates a tube-actuated grasper with precision-machined mechanisms enabling axial rotation and sustained grasp force generation. We validated the system's performance against 3mm laparoscopic instruments by performing standardized peg transfers. Then we measured its ability to facilitate suturing, both tasks being part of the Fundamentals of Laparoscopic Surgery (FLS). Mechanical performance was evaluated by measuring tool deflection under maximal tissue retraction forces (6N) applied 200mm from the instrument insertion point.

### **Results**

A surgical resident completed 10 familiarization trials with both robotic and manual instruments before formal testing. Three consecutive peg transfer trials and intracorporeal knot-tying tasks (surgeon's knot and sequential simple knots per FLS protocol) were recorded. We first compared our system with manual laparoscopic instruments in a series of three FLS peg transfer tasks. Average task completion time with the manual instruments was 96.4 ± 12 seconds with 1 peg dropped in one trial, compared to 97.4 ± 4 seconds with no peg drops with the robotic system. The robotic system was then able to facilitate the completion of 2 intracorporeal knot-tying tasks. Maximum deflection under 6N loading was 12.35mm, demonstrating superior retraction strength and grasping stability.

### **Conclusions**

This miniaturized robotic system represents a paradigm shift in needlescopic surgery, potentially extending robotic-assisted advantages to ultra-minimally invasive applications and reducing surgical morbidity across multiple surgical disciplines.

## Abstract # 32

**Title:** Obesity-Related Metabolites are Associated with Incident Coronary Heart Disease and Respond to Metabolic and Bariatric Surgery

**Authors:** Zicheng Wang, MS; Yulu Zheng, PhD; Lei Wang, PhD; Charles R. Flynn, PhD; Xiao-Ou Shu, MD PhD; Qiuyin Cai, MD PhD; Deepak K. Gupta, MD MSCI; Loren Lipworth, ScD; Wei Zheng, MD PhD; Xinmeng Zhang, BS; You Chen, PhD; Jason M. Samuels, MD; Danxia Yu, PhD

### Objective

Obesity is a major risk factor for coronary heart disease (CHD). This study aims to develop a metabolite signature of body mass index (BMI-MetSig) then assess its association with incident CHD and responsiveness to metabolic and bariatric surgery (MBS).

### Methods

In a case-control study of incident CHD nested within the Southern Community Cohort Study (SCCS) including 600 case-control pairs, we used elastic net regression with 10-fold cross-validation to derive the BMI-MetSig. Associations of BMI-MetSig with incident CHD was examined using conditional logistic regression in the nested case-control study. Further, in a cohort of 95 patients who received MBS, we evaluated this BMI-MetSig in association with estimated 30-year cardiovascular disease (CVD) risks, which was estimated by the American Heart Association's PREVENT equations, and examined changes of its constituent metabolites after surgery using linear mixed-effects models.

### Results

In the SCCS, the BMI-MetSig, comprising 94 metabolites, was significantly associated with incident CHD risk among all participants (OR per standard deviation [SD] increase: 1.48; 95% CI, 1.28-1.71) and across subgroups. Among MBS patients, the BMI-MetSig was significantly associated with increased estimated 30-year risks of CHD ( per SD increase: 1.29;  $p < 0.001$ ) and other CVDs. Levels of 17 (20.0%) and 19 (22.4%) metabolites in the BMI-Met-Sig significantly changed 3- and 12-month post-surgery (FDR < 0.10 and  $\log_2FC > 0.15$ ), including choline and acetyl-2-aminoadipate.

### Conclusions

The BMI-MetSig is associated with higher CHD incidence and estimated 30-year CVD risks and responds to MBS. BMI-MetSig may serve as a blood-based biomarker for cardiometabolic risk stratification and monitoring.

## Abstract # 34

**Title:** Intraductal papillary mucinous neoplasm-derived extracellular vesicles are associated with aberrant neural growth

**Authors:** AM Bontrager, KE Ankenbauer, PS Gowda, SV Ivanov, KE DelGiorno, BD Carter, MC Tan

### Introduction

Intraductal papillary mucinous neoplasm (IPMN) lesions of the pancreas are premalignant lesions that have the potential to transform into pancreatic ductal adenocarcinoma (PDAC), a disease with an approximate 13% 5-year survival rate. Our prior work revealed that neural infiltration increases with increasing dysplasia in IPMN, suggesting that neural invasion may be a key biological process in the malignant transformation of IPMN. Further, research on other cancers suggests that extracellular vesicles (EVs) play a role in neurotropism. We therefore sought to determine the impact of IPMN tumor-derived extracellular vesicles (EVs) on nerves, hypothesizing that tumor-derived EVs increase neural outgrowth and branching.

### Methods

EVs were harvested from an IPMN cell line derived from a genetically engineered mouse with a constitutive, pancreas-specific KRAS mutation and a doxycycline (DOX)-inducible GNAS mutation. Dorsal root ganglia (DRG) were isolated from wild-type mouse embryos. Neurons were cultured in media with a physiological concentration of nerve growth factor (NGF, 0.1ng/ml) with and without IPMN-derived EVs (with and without DOX treatment). Neurite extension was analyzed using Sholl analysis. The peak neural density, defined as the highest number of branches at a specific point, the length of the neuron, and the number of proximal branches, defined as those within 10  $\mu$ m of the soma, were recorded for each neuron. Univariate analysis was performed using t-tests for categorical data.

### Results

Preliminary data demonstrated that EV-treated neurons were significantly shorter than physiologic controls (controls: 120  $\mu$ m vs EV+DOX: 28  $\mu$ m,  $p < 0.05$ ). However, EV-treated neurons had a higher peak density of neurites than controls. The peak density of neurites was significantly higher than physiologic controls in neurons exposed to EVs (controls: 2.8 branches, EV+DOX: 8.0 branches,  $p < 0.05$ ). EV-treated neurons had significantly more proximal branches than controls (mean branches per neuron: control: 2.7, EV+DOX: 8.0,  $p < 0.05$ ). Neurons treated with EVs from IPMN cells without GNAS activation were also shorter and had higher neurite peak density, compared to controls.

### Conclusions

These preliminary data demonstrate that EVs from IPMN cell lines affect neuronal morphology by increasing peak neurite density and proximal branching but limiting outgrowth. This suggests that intra-tumoral neurons play a role in coordinating local control of tumor growth. Further investigations are ongoing to identify the molecular mediators within EVs and the mechanisms by which they act.

# **Clinical Outcomes & Quality Improvement**

## **Abstract # 1**

**Title:** Expanding Utilization of DCD Livers: Vanderbilt Experience with Normothermic Regional Perfusion

**Authors:** Wali Johnson, James Rogers, Martin Montenov

### **Introduction**

Donation after circulatory death (DCD) livers are frequently declined due to concerns for ischemic injury and biliary complications. Normothermic regional perfusion (NRP) restores in-situ circulation following circulatory arrest, potentially mitigating ischemic injury and improving graft function.

### **Methods**

We conducted a single-center, retrospective review of the first 103 DCD liver transplants performed with NRP at Vanderbilt University Medical Center 2021. Both abdominal (A-NRP) and thoraco-abdominal (TA-NRP) NRP were utilized. Donor, recipient, and perioperative characteristics were reviewed, with primary outcomes including graft survival and ischemic cholangiopathy (IC). Secondary outcomes included re-operation rates, length of stay (LOS), and early complications.

### **Results**

Among 103 recipients (11 A-NRP, 92 TA-NRP), donor acceptance extended to older age, higher BMI, and prolonged functional warm ischemia times. Seven NRP cases were followed by OCS. Three cases were censored due to early patient/graft loss within 30 days, unrelated to NRP (e.g., stress cardiomyopathy, donor-derived aspergillosis, and steal syndrome). Up to 15% of cases had >10% macrosteatosis. Fourteen patients required re-operation (11 for bleeding, 2 abscess, 1 bile leak). No patients experienced Olthoff definition for early graft dysfunction. Only one case of IC occurred, successfully managed with re-transplantation. 18% had biliary anastomotic stenosis or a leak. After censoring early losses, all patients remain alive with functioning grafts. Notably, excellent outcomes were observed even among recipients of high-BMI donors and complex cases (e.g., combined OLT-CABG, OLT-Whipple).

### **Conclusions**

NRP has enabled safe expansion of DCD liver utilization, with excellent graft survival and a notable decrease IC compared to super rapid DCD grafts. These findings support NRP as a transformative approach for improving outcomes and broadening donor acceptance criteria in DCD liver transplantation.

## **Abstract # 2**

**Title:** Finding the Biggest Charge: Cost Analysis to Quantify Electricity Consumption in the Operating Room

**Authors:** Steven Doctorman BS, Justin Lee BS, Noah Alter BS, Muhammad Daiem MD, MBBS, Mariam Saad MD, Chelsea Hamilton MS, LEED AP BD+C, César Castro AICP, Andrea K. George PhD, CHMM, PMP, BCEEM, Matthew E. Pontell MD, FAAP

### **Introduction**

Device usage in operating rooms (ORs) consumes significant electricity, resulting in high hospital expenditure and emissions. Prior studies have evaluated institutional policy approaches toward this problem,<sup>1,2</sup> but there is limited analysis of individual devices' energy consumption in United States ORs. This study's objective was to quantify the energy expenditure of equipment commonly used in the OR, serving as a foundation for future sustainability efforts.

### **Methods**

The 29 most commonly identified OR devices at a tertiary academic medical center were categorized as structural (built into ORs) or procedural (brought in for procedures). Each device's electrical utilization was quantified in kilowatt-hours using standard technical ratings and estimated use times. Cost calculations using 2024 electrical prices were scaled to estimate those in average (7 ORs, as per literature) and large (69 ORs, the setting of this study) size hospitals.

### **Results**

An average size hospital spends \$19,207 annually on OR equipment electricity; larger institutions spend around \$189,327 annually. Stand-alone suction devices, x-ray generators of C-arm x-ray machines, and heated air devices were the highest energy consumers. Procedural devices accounted for 64% of total annual electrical costs.

### **Conclusions**

Annual electricity costs for OR equipment at a large hospital equal that of five school buildings; an average size hospital equates to a warehouse. Stand-alone suction devices at a large hospital draws the equivalent as 5,120 electrical cars; even turning them off for one hour per day can save \$4,650.56 per year. Incremental reforms in OR equipment utilization can substantially reduce hospital expenses and carbon footprint.

## Abstract # 3

**Title:** Glasgow Coma Scale Variability and Outcome Prediction After Hospital Admission: A TRACK-TBI Study

**Authors:** Tyler J. Murphy MD; Jason K. Barber, MS; Alexander Osterhout BS; Nancy R. Temkin, PhD; Samuel Snider, MD; Mayur B. Patel MD, MPH; Geoffrey T. Manley MD, PhD; Yelena G. Bodien PhD; and the TRACK-TBI Investigators

### Introduction

The Glasgow Coma Scale (GCS) score obtained at hospital admission is widely used to assess traumatic brain injury (TBI) severity, establish prognosis, and define clinical trial eligibility. However, confounding factors may affect early GCS scores, resulting in misclassification of injury severity, inaccurate prognostication, and failure to detect treatment effects. We quantified GCS variability and predictive accuracy during the first five days of hospital admission for moderate-severe TBI.

### Methods

We analyzed data obtained in adults enrolled in the Transforming Research and Clinical Knowledge in TBI study between March 2014 and May 2021. We compared the TBI severity rating based on the admission GCS total score (GCS-A) to the severity rating based on the highest GCS total score observed on Days 1-5 post-admission (GCS-D1 to GCS-D5). We generated receiver operating characteristic curves (ROC) to compare the accuracy of GCS scores for predicting 6-month outcome on the Glasgow Outcome Scale-Extended (GOSE).

### Results

Among 3,092 participants, 387 met inclusion criteria (mean [SD] age 42.3[18.2] years; 75% male; 84[22%] GCS-A total 9-12 ["moderate"]; 303[78%] GCS-A total 3-8 ["severe"]). Relative to GCS-A, the GCS-D1 severity score was improved in 82% and unchanged in 18% of participants. By GCS-D1, 199(66%) participants with "severe" TBI per GCS-A improved to a score consistent with "mild/moderate" TBI. "Best" daily GCS was achieved in 74% of the overall sample by 10:00AM each hospital day. GCS-D1 predicted GOSE significantly better than GCS-A (Area Under ROC=0.87, vs 0.63;  $p<0.001$ ).

### Conclusions

GCS scores increased within 24 hours of admission, resulting in a lower TBI severity rating for two-thirds of participants. During this time, the prognostic accuracy of GCS also significantly improved. These findings suggest that GCS-A is an imprecise measure of TBI severity. A combination of serial behavioral evaluation along with blood and imaging biomarkers may improve TBI classification and prognostic accuracy.

## **Abstract # 5**

**Title:** Timing of OPO Assumption of Care as a Framework for Ethical Decision Making for Critical Care Providers

**Authors:** Robert D Sinyard, James Rogers, Bradley M Dennis, Stephen Gondek, China Stegall, Allan B Peetz

### **Introduction**

Financial incentives and policy changes have reshaped the relationship between organ procurement organizations (OPOs) and donor hospitals, but limited guidance exists regarding the transition of responsibility between critical care providers and OPOs. Prior research has suggested that this results in significant moral distress and ethical strain for providers. This study assessed the effect of potential variance of OPO assumption of costs of care for traumatically injured patients who underwent OPO referral as a framework for defining the timing of care transitions.

### **Methods**

Retrospective chart review was used to analyze 13 consecutive patients admitted to a single large academic medical center with devastating traumatic injuries and identified as organ donors within 48 hours of arrival. All direct care actions were identified for each patient from the trauma activation until organ procurement. Publicly available non-institutional cost data was used to assign direct costs to each care activity according to a time-driven activity-based cost methodology and these aggregate costs were compared at relevant points throughout the patients' clinical courses.

### **Results**

Average age was 42.1 years with a length of stay of 3 days and ISS of 33. A total of 579 direct care actions were identified and analyzed with a median of 40 care actions per patient (e.g. consultations, imaging studies, and procedures). Median direct donor hospital cost per patient was \$14,795 (SD: \$9460). Median patient-facing charges were \$59,180 (SD: \$37,841). Major cost contributors included trauma team activation, ICU care, procedural interventions (i.e. cardiac catheterization or liver biopsy), and transfusions. Costs were calculated for clinical time points where OPO care assumption may have occurred: determination of survivability, formal declaration of brain death, authori-

### **Conclusions**

Clarity around timing of OPO assumption of care is made evident from assumption of financial responsibility. More transparency about this process may assist providers in understanding this care transition and making ethically sound decisions regarding resuscitation and critical care.

**Table 1. Care Time and Associated Costs to Donor Hospital and Patient-Facing Charges**

	<b>Admission to Death (hr)</b>	<b>Admission to Procurement (hr)</b>	<b>Direct Donor Hospital Cost Estimate for Pre-Death Clinical Care (\$)</b>	<b>Direct Donor Hospital Cost for Post-Death Clinical Care (\$)</b>	<b>Patient Charges for Pre-Death Clinical Care (\$)</b>	<b>Patient Charges for Post-Death Clinical Care (\$)</b>
<b>Patient 1</b>	24	30	27490	6300	109960	25200
<b>Patient 2</b>	24	24	11407	76	45628	304
<b>Patient 3</b>	4	10	4087	3132	16348	12528
<b>Patient 4</b>	20	28	7752	3062	31008	12248
<b>Patient 5</b>	9	9	7398	46	29592	184
<b>Patient 6</b>	45	69	12085	4200	48340	16800
<b>Patient 7</b>	55	79	14955	4400	59820	17600
<b>Patient 8</b>	90	91	33660	200	134640	800
<b>Patient 9</b>	11	12	12695	200	50780	800
<b>Patient 10</b>	9	9	7398	46	29592	184
<b>Patient 11</b>	52	64	20400	2100	81600	8400
<b>Patient 12</b>	11	23	12695	2100	50780	8400
<b>Patient 13</b>	26	91	11900	15300	47600	61200

## **Abstract # 6**

**Title:** Implementing a Hospital-Based Firearm Lock Distribution Program

**Authors:** Katlyn G. McKay, MD, Heather L. Kreth, PsyD, Stacy Pecenka, MPH CPH, Kelsey A.B. Gastineau, MD, MPH

### **Introduction**

Firearm-related injuries are the leading cause of death among children and adolescents in the United States, with approximately one-third of these deaths attributed to suicide and 5% to unintentional shootings. Current research suggests that secure firearm storage practices could potentially prevent 6-32% of firearm-related youth deaths. Despite the critical nature of this public health issue, firearm safety counseling remains low in pediatric healthcare settings.

### **Methods**

The Locks for Children's Safety (LOCS) program was developed to create a low-barrier intervention towards improving firearm safety within a pediatric hospital environment. The primary goals were to distribute free firearm locks and promote secure firearm storage practices among families and hospital staff. Initiated in 2020 as a behavioral health quality improvement initiative, the program implemented a strategic distribution approach. Beginning in September 2024, clear bins containing 20 firearm locks were placed in key hospital locations, including the Pediatric Emergency Department, Pediatric Intensive Care Unit, and Acute Care floors. Multilingual signage emphasized that locks were free and required no documentation or identification. As interest grew, the number of distribution sites also expanded.

### **Results**

A total of 9,638 firearm locks were distributed across 22 hospital locations, with the highest volume in acute care medical and surgery floors (3,761 locks) and outpatient acute care clinics (1,306 locks). Monthly distribution remained consistent, averaging 500-700 locks. Notably, the program received little negative feedback and was met with overwhelmingly positive responses from families, physicians, and staff.

### **Conclusions**

The LOCS program represents an innovative approach to addressing pediatric firearm injury prevention. By leveraging hospital infrastructure and adopting a non-judgmental, accessible distribution model, the program successfully lowered barriers to distributing firearm safety tools. The initiative demonstrates the role of hospitals in playing a meaningful role in child safety interventions, reaching patient families, caregivers, and employees with minimal workflow disruption. Planned next steps include developing a voluntary, anonymous survey to gather more detailed information about lock usage and secure storage preferences.

## Abstract # 8

**Title:** Effect of Preoperative GLP-1 Receptor Agonist Use on Post-Bariatric Surgery Weight Loss

**Authors:** King D, Spann MD, Northup CJ, Ardila Gatas J, Williams B, Sohn Ine, Zhu Y, Samuels JM

### Introduction

Although glucagon-like peptide-1 receptor agonists (GLP-1RAs) are increasingly used for obesity management, their impact on weight loss after bariatric surgery is unclear. This study aims to examine the effect of preoperative GLP-1RA use on post-bariatric surgery weight loss.

### Methods

This retrospective cohort analyzed 938 patients who underwent sleeve gastrectomy or gastric bypass January 2022 – June 2025. Electronic health record data was linked with insurance claims data to identify GLP-1RA use (semaglutide or tirzepatide) in the year prior to surgery. A multivariable linear regression was conducted to evaluate percent total body weight loss (%TBWL). Logistic regression was performed to assess emergency department (ED) visits and hospital admission six months post-surgery. Models were adjusted for age, sex, race/ethnicity, baseline BMI, Type 2 diabetes, and surgery type.

### Results

312 (33.3%) patients used GLP-1RAs preoperatively. GLP-1RA patients had significantly less weight loss six months postoperatively versus non-GLP-1RA patients (-2.18 %TBWL, 95% CI: -3.0 - -1.4). Older age (-1.54 %TBWL, 95% CI: -2.08 - -1.00) and sleeve gastrectomy (-2.37 %TBWL, 95% CI: -3.12 - -1.62) were associated with decreased %TBWL. Possibly due to low event rates, GLP-1RA use (OR: 1.47, 95% CI: 1.01 - 2.14, Figure 1) was associated with higher odds of ED visits. Sleeve gastrectomy was associated with lower odds of ED visits (OR: 0.51, 95% CI: 0.35 - 0.74). Older age was associated with higher odds of hospital admission (OR: 1.37, 95% CI: 1.08 - 1.73).

### Conclusions

This retrospective single-center study suggests the use of preoperative GLP-1RA may reduce %TBWL at six months after bariatric surgery.

## **Abstract # 9**

**Title:** Incorporation of Radiologic Imaging in Mohs Micrographic Surgery Workflow for Assessment of High-Risk Cutaneous Squamous Cell Carcinoma

**Authors:** Athira Sivadas, BA, Kevin Varghese, MD, Atieh Jibbe, MD

### **Introduction**

Mohs micrographic surgery (MMS) is an effective treatment for many high-risk cutaneous squamous cell carcinomas (cSCCs), offering superior margin control and lower recurrence rates compared with standard excision. Recent studies demonstrate that imaging can reveal clinically occult nodal metastasis or deep invasion in a substantial proportion of high-risk tumors. However, these studies were not conducted in Mohs cohorts and do not address how imaging should be incorporated into MMS-specific workflow or decision-making. Given the growing evidence supporting selective imaging in high-risk cSCC and the lack of Mohs-focused guidance, a synthesis of existing literature is needed.

### **Methods**

A literature search was performed in PubMed to identify studies evaluating radiologic imaging in cutaneous squamous cell carcinoma (cSCC). The initial search used the terms “cutaneous squamous cell carcinoma” AND “imaging,” yielded 260 articles. Additional searches combined “cutaneous squamous cell carcinoma” individually with “ultrasound,” “MRI,” “CT,” and “PET” to ensure capture of modality-specific studies. A PRISMA-style approach was used to document article identification, screening, exclusion, and inclusion.

### **Results**

A total of 16 studies evaluating radiologic imaging in high-risk cutaneous squamous cell carcinoma (cSCC) met inclusion criteria. Imaging was most commonly obtained for tumors with BWH T2b/T3 staging, deep invasion, or recurrent disease. Across studies, radiologic evaluation frequently identified clinically occult nodal or locally invasive disease, and management was altered in 6–50% of cases depending on modality. CT was the most frequently used imaging study, comprising 51–73% of evaluations. PET/CT was the second most commonly used modality, representing 21–42% of imaging studies. Overall, across imaging modalities, radiologic assessment frequently identified clinically occult disease that could meaningfully influence decisions surrounding MMS.

### **Conclusions**

Taken together, these findings support a structured, stepwise approach to incorporating imaging into Mohs practice. Evaluation begins with identifying high-risk clinical or histologic features—including deep invasion, poor differentiation, perineural involvement, rapid growth, recurrence, or immunosuppression—with attention to the tumor’s relationship to regional nodal basins. Incorporating imaging within this framework may assist Mohs surgeons in determining when MMS is appropriate, when multidisciplinary management should be prioritized, and how postoperative surveillance ought to be tailored for patients with radiologically demonstrable high-risk features.

## **Abstract # 11**

**Title:** Improving Surgical Innovation: A Cross-Sectional Survey of Perceived Facilitators and Barriers

**Authors:** Clayton R. Baker, BS, Jackson Appelt, BS, Adria A. Villafranca, BS, Carly M. Eckert, MD, PHD, MPH, Kevin W. Sexton, MD

### **Introduction**

Institutional support and implementation capacity for surgical innovation varies. We identified perceived facilitators and barriers to innovation across surgical faculty, trainees, and staff.

### **Methods**

A single-center, cross-sectional survey was distributed in December 2025 to surgical faculty, staff, and trainees. Respondents evaluated 16 statements (5-point Likert scale) regarding culture/readiness, resources/infrastructure, access to training/knowledge, perceived value/communication, and implementation barriers, and completed two free-response items about limitations and improvement strategies. Outcomes were descriptive proportions endorsing each statement and thematic frequencies.

### **Results**

Of 43 respondents, 44% were attending physicians, 40% residents, and 12% APPs/other support staff. Most endorsed an innovation-supportive culture (35/43, 81%) and engaged leadership (33/43, 77%); however, only 50% (22/43) agreed their organization encourages experimentation and learning from failure. Sixty-three percent (27/43) agreed innovations benefit patient care or institutional goals, while 49% (21/43) agreed complexity impedes implementation. Operational support was less consistently endorsed, including dedicated innovation infrastructure (19/42, 45%), adequate staff/equipment/funding (18/43, 42%), and IT support for integration of new technologies (20/43, 47%). The most frequently endorsed barriers were financial limitations (34/43, 79%) and competing demands/workload (33/43, 77%). Free-text barriers commonly included lack of protected time (14/38, 37%) and funding constraints (10/38, 26%), with suggested strategies emphasizing protected time/workload relief (8/37, 22%) and financial support (7/37, 19%).

### **Conclusions**

Surgical stakeholders reported strong cultural support for innovation but identified time, funding, and operational infrastructure as dominant barriers. These findings support testing targeted implementation supports (protected time, integration resources, standardized piloting pathways) in future multicenter studies to assess their impact on surgical innovation adoption.

## Abstract # 12

**Title:** A Blood-Based Biomarker Strategy for Enhancing Diagnosis of Indeterminate Pulmonary Nodules

**Authors:** Hudson M. Holmes MD, Kevin C. McGann, MD, Sheau-Chiann Chen, PhD, Cole Welch, Yong Zou, MS, Sanja Antic, MD, Yency J. Forero, MD, Samson A. Argaw, MD, MPH, Heidi Chen, PhD, Alex Kaizer PhD, Anna Barón PhD, Robert Meguid, MD, MPH, Fabien Maldonado, MD, MSc, Stephen A. Deppen, PhD, Eric L. Grogan, MD, MPH

### Objective

To evaluate whether combining commercial cancer protein biomarkers and benign fungal antibodies improves diagnostic accuracy in indeterminate pulmonary nodules. We sought to determine whether biomarkers in isolation and with clinical (age, smoking, cancer history) and radiographic variables (nodule size, shape, and location) in the Mayo Clinic Model improve diagnostic accuracy in regions with historically high and low rates of histoplasmosis.

### Methods

Patients from two geographically distinct cohorts (Ohio River Valley [ORV] and Mountain West [MW] regions) with indeterminate pulmonary nodules (IPNs) 6-30mm in diameter were included for retrospective analysis. All patients had Mayo Clinic model variables, and serum measurements of four cancer proteins (CYFRA 21-1, CEA, CA-125, and HE-4) and histoplasma immunoglobulins G (IgG) and M (IgM) available. Serum samples were collected prospectively and bio-banked at -80 °C in the Thoracic Biorepository. Subsequent assays were performed on commercial platforms (Roche Cobas e411, MiraVista ELISA) in CAP-certified laboratory environments. All variables were treated as continuous data: cancer biomarker concentrations were measured in ng/mL, fungal antibody levels were reported in optical density, and Mayo scores were given as probability of malignancy. The area under the receiver operating characteristics curve (AUC) was calculated for the cancer biomarkers, fungal biomarkers, and their combination based on final diagnosis. Diagnosis was adjudicated by either tissue pathology confirming benign or malignant disease or clear documentation of at least two years of stable radiologic follow-up consistent with benign disease. Multivariable logistic regression models were fitted for each pairwise combination and the combination model including all variables (full model).

### Results

A total of 366 patients were included. The ORV cohort comprised 282 patients, and the MW cohort contained 84 patients. The AUC of the cancer biomarkers alone was 0.71 (95% CI, 0.64-0.76) in the ORV cohort and 0.77 (95% CI, 0.66-0.88) in the MW cohort. The AUC of the fungal antibodies alone was 0.61 (95% CI, 0.55-0.69) and 0.63 (95% CI, 0.55-0.74) in these cohorts, respectively. The combination of cancer biomarkers and fungal antibodies had an AUC of 0.74 (95% CI, 0.68-0.79) and 0.78 (95% CI, 0.66-0.88). The Mayo Model alone had an AUC of 0.74 (95% CI, 0.67-0.80) and 0.67 (95% CI, 0.59-0.77). The full combination model had an AUC of 0.79 (95% CI, 0.74-0.85) and 0.79 (95% CI, 0.71-0.88), respectively.

### Conclusions

The combination of commercial cancer protein biomarkers and fungal antibodies improves diagnostic accuracy in IPNs in both the Ohio River Valley and Mountain West cohorts. A full combination model integrating cancer protein biomarkers, fungal antibodies, and an established clinical prediction tool provides a feasible approach to better discriminate benign from malignant nodules.

## Abstract # 14

**Title:** Ursine Associated Trauma in Alaska

**Authors:** Luke R. Johnston, MD, MBA, FACS; Charlotte Bender, MS, MPH; Elisha Brownson, MD, FACS

### Introduction

Bear attacks represent a rare but high-morbidity subset of wilderness trauma, with increasing relevance as human activity encroaches on bear habitats. Prior literature has described isolated cases and small series, often emphasizing the dramatic nature of injuries but lacking systematic analysis of clinical patterns and outcomes. This case series provides a comprehensive review of 55 bear-related trauma encounters in Alaska from 2012-2022, offering insight into injury mechanisms, treatment strategies, and survivorship.

### Methods

We conducted a retrospective review over 10 years utilizing the Alaska Trauma Registry and State of Alaska Division of Public Health Vital Records to identify victims. Data collected included age, sex, race, residency status, activity at time of attack, bear species involved, injury type and severity, transport method, hospital course, insurance status, and discharge disposition. Descriptive statistics were used to summarize findings.

### Results

We identified 54 victims of bear attacks. 45 (83.3%) patients survived to receive medical care and 9 (17.7%) died prior to arrival at a hospital. Of survivors, most were male (N=36, 75%), white (N=13, 95.6%) and Alaska residents (N=44, 91.7%). Brown "grizzly" bears (N=38, 79.2) followed by black bears (N=3, 6.3%) were most common. All patients who survived to receive medical attention survived to discharge (100%, N=45) yielding a mortality rate of 17.7% (n=9). Of survivors, mean injury severity score was 12.3 (range 1-34). Lacerations were universal (N=45, 100%) with the scalp and face being the most common (N=29, 64.4%). Fractures were the second most common injury (N=27, 60%) with skull/facial fractures (N=11, 24.4%) and lower extremity fractures (N=9, 20%) being most common. Traumatic brain injury was identified in six patients (13%). Intracavitary injuries were rare and included pulmonary contusions (N=2, 4.4%) and a grade II liver laceration (N=1, 2.2%). Most patients were taken directly to the operating room after initial resuscitation (N=31, 68.8%). Most common procedures performed included wound debridement (N=22, 48.9%), laceration repair (N=18, 40%), and open reduction/internal fixation (N=15, 33.3%). Craniotomy (N=2, 4.4%) and laparotomy (N=2, 4.4%) were also performed required. Intensive care unit admission was required for 8 patients (17.8%). Mean hospital length of stay was 6.0 days with a median of 3 days (range 1-26 days). A majority of patients were discharged to home with self-care (N=32, 71.1%)

### Discussion

Bear-related trauma presents a unique clinical challenge marked by high rates of soft tissue and skeletal injury which require surgical management. These findings align with previous reports, and expands with the largest series of attacks and documentation of injury patterns that need to be evaluated for and managed. Despite these factors, outcomes are favorable for patients who survive to receive medical care. Further research is warranted to explore long-term outcomes and psychological impacts on survivors.

## **Abstract # 19**

**Title:** Surgical Safety of Combined Dorsal and Ventral Rhizotomy for Mixed Hypertonia

**Authors:** Alexander Partida, BS, Tag Alsir F. Osama, BS, Amanda Stanton, MD, George Koutsouras, MD, Ranbir Ahluwalia, MD, Elizabeth Martin, MD, Alice Lawrence, PT, MD, Robert Naftel, MD

### **Introduction**

Selective Dorsal Rhizotomy (SDR) treats spasticity by selectively severing hyperactive sensory rootlets. SDR can reduce spasticity but not dystonia. Combined selective dorsal and ventral rhizotomy (CDVR) extends this approach by additionally sectioning ventral rootlets, thereby treating dystonia. For patients without independent mobility, this powerful approach allows for ease of care and comfort. The current literature is lacking on outlines of postoperative complications and comfort changes after CDVR. This study examines safety and complication rates in non-ambulatory patients with mixed spasticity and dystonia who underwent CDVR.

### **Methods**

Case series of all patients at Monroe Carell Junior Children's Hospital at Vanderbilt who underwent conus-level combined dorsal and ventral rhizotomy for palliation of mixed hypertonia between 2019 and 2024. Data was analyzed using one-sample and paired t-tests, with significance defined as  $p \leq 0.05$ .

### **Results**

A statistically significant postoperative decrease in Modified Ashworth Scale (mean=-2.31, SD=0.91,  $P = 2.24e-05$ ) was observed. Patients with a previous lumbar spinal fusion had significantly greater estimated blood loss ( $P = 0.001$ ) and a longer operative time ( $P < 0.001$ ). No major surgical complications were seen at 90 days (cerebrospinal fluid leak, meningitis, bleeding, reoperation). Urinary retention was seen in 5 patients (28%), 1 needing catheterization for 5 days and 4 requiring clean intermittent catheterization during their hospitalization. All patients returned to preoperative urinary status at 90 days postop. Leg swelling was seen in 3 patients (17%), which was managed in all cases with compression stockings and resolved by 3 months. One incisional skin infection was treated successfully with oral clindamycin.

### **Conclusions**

There were no major surgical complications at 90 days postop for patients who underwent CDVR. All minor complications were managed conservatively.

## Abstract # 20

**Title:** Robotic-Assisted Resection of Pediatric Intracavitary Lesions: Expanding the Boundaries of Minimally Invasive Surgery

**Authors:** Vikas S. Gupta MD, Alejandro O. Chara MD, James L. Rogers BS, Roshan J. D’Cruz MD, Megan Stout MD, Brendan Frainey MD, Lauren Corona MD, Douglass B. Clayton MD\*, Harold N. Lovvorn, III MD\*, and Irving J. Zamora MD\* (\* Co-senior authors)

### Introduction

Purpose: Describe the implementation of robotic-assisted surgery in managing pediatric cysts and neoplasms and characterize intra- and post-operative outcomes.

### Methods

Pediatric patients at a quaternary children’s hospital who underwent any robotic-assisted surgical procedure for cysts or neoplasms between 2011-2025 were studied retrospectively. Demographic, lesion, operative, and outcome data were analyzed.

### Results

Twenty-eight (4%) of 652 total pediatric robotic cases were reviewed. This cohort had a median age of 12.5 (IQR: 5.75-15) years. Fifteen intracavitary cysts and 13 neoplasms were resected. Three robotic-assisted nephrectomies were performed for Wilms tumor (one each partial and radical) and neurofibroma. Remaining cases consisted of thymectomies (n=2), mediastinal teratoma excision, lung lobectomy, distal pancreatectomy, pancreatic uncinata resection, pancreaticoduodenectomy, adrenalectomy, ovarian cystectomy, and radical cystoprostatectomy. Median EBL was 15 mL (IQR:5-26.25) and day of discharge 1 (IQR: 0-2). Median morphine equivalent dose at discharge was 2.65mg (IQR: 0-7.5) with duration of 1 (0-3) day. Twenty-one (75%) patients experienced no complications. Notable complications after the uncinata resection included hemorrhagic pancreatitis on POD3 and the pancreaticoduodenectomy that developed late biliary stenosis and a rim-enhancing lesion likely from a ductal leak that required anastomotic revision 1.5 years postoperatively.

### Conclusions

Robotic assistance is an emerging tool for complex minimally invasive resections of pediatric masses. This technology offers the possibility of short hospital stays, low postoperative opioid use, and quick return to therapy if malignant. Patient selection is paramount, but this experience highlights the safety and feasibility of surgical robotics in the management of these lesions in children.

## **Abstract # 21**

**Title:** Augmenting Trauma Registry Abstraction with Artificial Intelligence: A Value-Added Proposal

**Authors:** Zongyang Mou, Carly Eckert, Yash Trivedi, Luke Jones, Allan B. Peetz, Kevin Sexton, Andrew Medvezc

### **Introduction**

Abstracting data for trauma registries is a time and labor-intensive process. Artificial intelligence (AI) may enhance manual chart review by automatically extracting variables, screening out negative cases, and providing more granular detail on positive cases. Brim is an AI platform that assists with chart abstraction from unstructured chart documentation (e.g. clinical notes, imaging reports). We hypothesized that Brim could abstract a complex trauma registry variable with a high degree of sensitivity and cost-effectiveness.

### **Methods**

We evaluated Brim's performance in adult trauma patients admitted to a level 1 trauma center. The variable unplanned return to operating room (RTOR) was selected for evaluation as it is a complex variable with significant related chart documentation that can take extensive time to review. Positive cases often prompt further review to identify cause and opportunities for improvement. Thus, for positive RTOR cases, we prompted Brim to classify reason for RTOR into hemorrhage, infection, or another cause. Brim results were compared to the gold standard of manual abstraction by trained registrars.

### **Results**

Of 6,019 patients, 50 had an unplanned RTOR identified in the trauma registry by manual review. Brim identified 45 true positive cases and 140 false positive cases, yielding sensitivity of 90%, specificity of 97.6%, positive predictive value of 24.3%, and negative predictive value of 99.9%. In classification of the reason for RTOR among the 45 true positive cases identified, Brim correctly categorized 23/23 hemorrhage cases, 12/13 infection cases, and 6/9 other cause cases. Using Brim, abstraction required 128 minutes and cost \$452. In comparison, a registrar abstracting this variable can take 5 minutes per patient requiring 30,095 minutes (~501 hours) to complete the same task, costing \$15,674.

### **Conclusions**

AI quickly and economically abstracts trauma registry variables from unstructured documents. It focuses process improvement efforts by providing granular detail on complex binary variables in the trauma registry on-demand with little additional cost.

## Abstract # 23

**Title:** Severe Heterotopic Ossification After Posterior Acetabular Fixation is Rare and Predictable: An Analysis of 1288 Cases Without Prophylaxis

**Authors:** Lauren Luther, Devan Kumar, Sophia A. Traven, Nathaniel Elliot Schaffer, Robin Maria Litten, Richard S. Moore, Andres Fidel Moreno-Diaz, Juanita Velasco-Castro, Ridge Maxson, Anna E. Sumpter, Abhinav Agarwal, Robert Hunter Boyce, Cory A. Collinge, Jason M. Evans, A. Alex Jahangir, Joseph P. Johnson, Hassan Riaz Mir, Aaron M. Perdue, Jonathan H. Quade, Manish K. Sethi, Clay Spitler, Daniel J. Stinner, Lauren M. Tatman, Phillip M. Mitchell

### Introduction

Heterotopic ossification (HO) is a known complication that can occur after acetabular fracture repair through a posterior approach to the acetabulum. HO can cause pain, stiffness, and restricted motion, occasionally requiring excision. Prophylactic radiation (XRT) reduces the risk of severe HO but exposes patients to the risks of radiation. The prevalence and predictors of severe HO in a modern cohort is not well defined. The purposes of this study were to quantify the rate of severe HO without prophylaxis and identify patient characteristics associated with its devel-

### Methods

A retrospective review was conducted at two Level I trauma centers of adult patients who underwent operative fixation of an acetabulum through a Kocher-Langenbeck (KL) approach over a 15-year period (2010-2025). Patients were excluded for perioperative HO prophylaxis, periprosthetic fracture, simultaneous arthroplasty, less than six weeks follow-up, and unplanned re-operation within six weeks. HO was independently graded by two fellowship-trained traumatologists, with a third adjudicating cases with disagreement. Severe HO was defined as Brooker grade III or IV. A multivariable mixed-effects logistic regression model including surgeon as a random effect was performed to identify variables associated with increased risk of developing severe HO.

### Results

1288 patients met inclusion criteria. Severe HO was present at final follow-up in 64 (4.9%) patients and 14 (1.1%) underwent HO excision. Severe head injury (OR 2.2,  $p=0.04$ ), ventilator time greater than three days (OR 5.6,  $p<0.001$ ), spinal cord injury (OR 6.0,  $p=0.012$ ), African-American race (OR 4.3,  $p<0.001$ ), and dual approaches to the acetabulum (OR 5.3,  $p<0.001$ ) significantly increased the risk of developing severe HO. Using this model, a patient with no risk factors is predicted to have a 4% risk of severe HO, compared to a 30% risk in the same patient with a head injury and prolonged ventilation.

### Conclusions

Severe HO and HO excision are rare outcomes following a posterior approach to the acetabulum. However, clearly defined risk factors substantially increase the risk. Routine radiation should be reconsidered in favor of a selective approach to minimize the morbidity of HO, while avoiding unnecessary radiation exposure to low-risk patients.

## Abstract # 24

**Title:** Intraoperative Technique does not affect Stroke Rates after Minimally Invasive Mitral Valve Surgery: A Contemporary Analysis

**Authors:** Christian Eidson BS; Awab Ahmad MD; Walter Navid BA; Emma Stimpfl BS; Esha Chawla BS; Aaron M. Williams MD; John Trahanas MD; Rebecca Kiern; Lisa Slinger; Swaroop Bommareddi MD; Eric Quintana MD; Brian Lima MD, MBA; Ashish S. Shah MD; Tarek Absi MD.

### Introduction

Stroke is a devastating complication after minimally invasive mitral valve surgery (MIMVS) with a significant impact on perioperative morbidity and mortality. Prior studies have identified age, history of cerebrovascular accidents (CVA), mitral valve replacement, femoral cannulation, and endocarditis as its independent predictors. Prolonged cardiopulmonary bypass time and choice of myocardial technique have a less clear impact on stroke risk in this setting. This study aims at elucidating the pre- and intra-operative factors that are significant stroke predictors in a contemporary cohort of patients undergoing MIMVS with a variety of intra-operative techniques.

### Methods

A single-center retrospective analysis was conducted on adult patients who underwent MIMVS between July 2011 and December 2024. Patients were stratified based on the incidence of postoperative stroke, and pre-and intra-operative characteristics were compared. Multivariable logistic regression using backward elimination technique was used to identify the most significant risk factors for stroke.

### Results

Among 1,258 patients who underwent MIMVS, 40 (3.2%) sustained a subsequent stroke. These patients were significantly older (median age 72 vs. 65 years,  $p < .001$ ), had a lower BMI (24.1 vs. 26.4,  $p = 0.03$ ), had a higher prevalence of prior CVA (27.5% vs. 11.8%,  $p = 0.006$ ) and previous percutaneous coronary intervention (PCI) (30% vs. 14.9%,  $p = 0.01$ ), and had a higher rate of MV endocarditis (17.5% vs. 6.1%,  $p = 0.004$ ) compared to the rest of the cohort. Importantly, there was no significant difference in the rates of procedure type (repair vs. replacement), cannulation site (femoral vs. axillary), cardiopulmonary bypass time, or myocardial protection technique (hypothermic fibrillatory arrest vs. aortic cross-clamp) between patients who had a stroke and patients who did not ( $p > 0.05$ ). Multivariate logistic regression analysis identified age (OR 1.06, 95% CI 1.03-1.09,  $p < .001$ ), endocarditis (OR 4.15, 95% CI 1.50-10.3,  $p = 0.003$ ), and prior CVA (OR 2.22, 95% CI 1.00-4.59,  $p = 0.04$ ) as independent predictors of stroke.

### Conclusions

In this contemporary cohort of patients undergoing MIMVS, advanced age, prior cerebrovascular disease, and endocarditis remain significant predictors of stroke. Notably, procedure type, cannulation site, cardiopulmonary bypass time, and choice of myocardial protection technique did not pose an increased risk. These findings suggest that, in the modern era, intraoperative factors are not associated with an increased stroke risk following MIMVS.

## **Abstract # 25**

**Title:** Health Literacy and Surgical Treatment of Breast Cancer

**Authors:** Emma Bradley, Palina Woodhouse, Danish Ali, Rachel McCaffery & Kamran Idrees.

### **Introduction**

Breast cancer treatment can be complex, incorporating multimodality treatments that depend on patient understanding, participation and shared decision making. While health literacy (HL) has been shown to be a key determinant of health in many chronic diseases, the way in which it may affect oncologic treatment of breast cancer is less well defined. Here we aim to elucidate the impact of HL on surgical treatment of breast cancer and outcomes.

### **Methods**

A cohort of newly diagnosed breast cancer patients from 2005-2022 at a single academic tertiary care center was retrospectively reviewed. Patient health literacy was assessed using the Brief Health Literacy Screen (BHLS). Multivariable logistic regression was used to determine associations between patient health literacy, cancer stage and likelihood of undergoing certain types of surgical intervention. Multivariable Cox proportional hazard model was used to assess the impact of health literacy on overall and disease free survival.

### **Results**

Out of a total of 3918 breast cancer patients, mean BHLS was 13.9 (SD 2.1, range 3-15). Patients with low health literacy were more likely to be older (median age 64 vs 58), non-White (21.1% vs 14.3%), and less likely to hold private insurance (26.9% vs 55.3%). Adjusted for patient and oncologic characteristics, higher HL was protective against presenting with later stage disease (OR 0.89, CI [0.86-0.91]). In patients with non-metastatic disease undergoing mastectomy, higher HL was associated with an increased odds of undergoing prophylactic contralateral mastectomy (OR 1.07 [1.01-1.14]) and reconstruction (OR 1.10 [1.04-1.17]). There was no difference in receipt of breast conservation therapy vs mastectomy associated with patient HL (OR 1.002 [0.97-1.04]). Higher HL was associated with a decreased adjusted risk of all-cause mortality in breast cancer patients (HR 0.90 [0.87-0.92]) and decreased adjusted risk of breast cancer recurrence (HR 0.94 [0.89, 0.98]).

### **Conclusions**

This study demonstrates that low HL has an impact on stage at presentation, surgical treatment and survival outcomes in breast cancer patients. These findings emphasize the importance and value of assessing and understanding HL in the shared decision making process of oncologic breast cancer treatment. Future investigation into the impact of HL on other breast cancer treatment modalities and how to enhance patient care in a HL sensitive way has the potential to improve patient experience and survival outcomes.

## Abstract # 26

**Title:** Early Physiology Outperforms Anatomic Injury Severity in Predicting Organ Dysfunction After Pediatric Solid Organ Injury

**Authors:** Benjamin C House, B.S., Zhiguo Zhao, Yu Shyr, PhD, Tatiana Zabaleta, MD, MPH, Harold N Lovvorn III, MD

### Introduction

Traumatic injury remains the leading cause of mortality for ages 1–45 in the US. In pediatric trauma, substantial cardiorespiratory reserve can mask hemodynamic instability despite significant injury. Although NOM has become the standard of care for pediatric solid organ injuries (SOIs), the field has shifted away from reliance on AAST injury grade alone, which has not consistently correlated with intervention need or clinical outcomes, toward physiology-based frameworks. Despite this paradigm shift, early identification of patients at risk for organ dysfunction remains challenging. We sought to determine whether admission SIPA outperforms AAST grade and contrast extravasation in predicting pediatric Sequential Organ Failure Assessment (pSOFA)-defined organ dysfunction in pediatric trauma patients with blunt SOIs undergoing NOM.

### Methods

We conducted a retrospective cohort study of 303 trauma patients  $\geq 18$  years with radiographically-confirmed non-operative SOI at a level I pediatric trauma center from 2017–2025. The primary outcome was peak pSOFA score, categorized into ordered severity groups (0, 1–2, U3). Secondary outcomes included ICU and hospital length of stay. Ordinal logistic regression modeled the primary outcome and logistic or linear regression secondary outcomes, adjusting for U2 SOIs, age, sex, institution, maximum AAST grade, and contrast extravasation.

### Results

Among 303 patients (median age:10(IQR,6.5–13), 60% male, 29% AAST grade IV–V), SIPA=1.04(IQR,0.85–1.23); 61% pSOFA=0, 27% 1–2, 12% U3, SIPA independently predicted pSOFA severity (odds ratio[OR]=8.83, 95%CI=3.53–23.0, $p<0.001$ ). U2 concurrent SOIs (OR=3.28,95%CI=1.78–6.05, $p<0.001$ ) and age (OR=1.20,95%CI=1.12–1.29, $p<0.001$ ) were also significant predictors. Notably, AAST grade 3 was paradoxically protective vs. grade 1 (OR=0.40,95%CI=0.17–0.97, $p=0.040$ ); no other anatomic predictor reached significance. SIPA added predictive value beyond anatomic covariates. SIPA remained an independent predictor of hospital LOS and ICU LOS, while anatomic predictors lost significance after adjustment.

### Conclusions

Among pediatric NOM patients with blunt SOI, admission SIPA independently predicted organ dysfunction and resource utilization, whereas anatomic descriptors did not. Although SIPA is already validated for management decisions, these findings extend its utility to predicting downstream organ dysfunction, supporting the ongoing paradigm shift away from anatomic grading toward physiology-based risk stratification. These findings support a physiology-based framework for risk stratification that may improve monitoring and escalation decisions during NOM in the pediatric setting.

## Abstract # 27

**Title:** Surgeon-Fashioned Biologic Roots versus Prefabricated Bioprosthetic Aortic Valve Conduits: A Comparative Analysis of Early Outcomes After Aortic Root Replacement

**Authors:** Walter Navid, Emma Stimpfl, Awab Ahmad, John Trahanas, Brian Lima, Swaroop Bommareddi, Eric Quintana, Chen Chia Wang, Mark Petrovic, Lauren Oliver, Ashish S Shah, Aaron M Williams, Tarek S Absi.

### Introduction

Aortic root replacement (ARR) with a bioprosthesis can be performed either by constructing a surgeon-fashioned 'bio-root' (stented bioprosthetic valve sewn to a Dacron graft on the back table) or using a commercially available, prefabricated bioprosthetic aortic valve conduit (BAVC). Despite the widespread use of both techniques, comparative outcome data remains limited.

### Methods

Isolated ARRs performed at a single institution from November 2017 to June 2025 were retrospectively analyzed. Indications for operation were aortic valve replacement with aneurysm (n=110) or small aortic root (n=2), acute aortic dissection (n=24), degenerated prior valve prosthesis (n=14), and endocarditis (n=4). Perioperative characteristics were compared using univariate analyses, and propensity-score matching (1:1) was employed to adjust for baseline and intraoperative differences. The primary outcomes were reoperation for bleeding and 30-day mortality. Secondary outcomes included stroke, postoperative atrial fibrillation, need for permanent pacemaker (PPM), and need for renal replacement therapy (RRT).

### Results

Of the 154 aortic root procedures, 126 (81.8%) were performed with a bio-root and 28 (18.2%) with a commercially available BAVC. Cardiopulmonary bypass times were longer (184.5 vs. 144 min,  $p=0.005$ ), and concomitant total arch replacement was more frequent (10.7% [3/28] vs. 1.6% [2/126],  $p=0.04$ ) in BAVC vs. bio-root, respectively. However, BAVC patients experienced similar rates of reoperation for bleeding (3.6% [1/28] vs. 11.9% [15/126],  $p=0.31$ ) and 30-day mortality (3.6% [1/28] vs. 4.8% [6/126],  $p>0.99$ ). Following propensity matching (n=28 per group), outcomes remained comparable: reoperation for bleeding 10.7% vs. 3.6% ( $p=0.61$ ) and 30-day mortality 10.7% vs. 3.6% ( $p=0.61$ ). The incidences of postoperative atrial fibrillation, stroke, need for PPM and RRT were also similar between the matched groups (Table 1).

### Conclusions

In this single-center series, the use of a surgeon-fashioned bio-root resulted in equivalent early outcomes compared to the prefabricated BAVC after adjustment. Both techniques appear to be safe and effective, allowing operative approach to be guided by surgeon preference.

## Abstract # 28

**Title:** Patient Portal Use Among Patients with CKD at a Large Academic Medical Center

**Authors:** Marianna D Frazee MD, Bryan D Steitz PhD, S. Trent Rosenbloom MD MPH, Kerri L Cavanaugh MD, Allison B McCoy PhD ACHIP, Elisa J Gordon PhD MPH

### Introduction

Patients increasingly use patient portals (portals) to support chronic disease management, and portal use has been shown to improve health care utilization, treatment adherence, and quality of care. Studies have shown higher portal use amongst patients with chronic medical conditions compared to their healthier counterparts, however, limited work has been done to study patterns specific to patients with chronic kidney disease (CKD). Given the medical complexity and demands of day-to-day management of CKD care, portals may play an important role in facilitating patient-provider communication and patient self-management. Understanding patterns of portal use among patients with CKD can inform strategies to enhance patient engagement in their care, facilitate disease management, and potentially slow disease progression.

### Methods

We conducted a retrospective observational study from August 1, 2024 to July 31, 2025 to assess portal usage among patients with stage 3 and 4 CKD receiving outpatient care at a large academic medical center. Portal engagement was assessed as: total nephrology results reviewed, number of patient-initiated message threads, number of logins, and average time spent using the portal (in minutes). Portal usage patterns were compared by stages of CKD to evaluate relationships between disease severity and portal engagement. Continuous portal engagement outcomes were compared between stage 3 and 4 CKD patients using the Wilcoxon rank-sum test given skewed distributions. Data are reported as median (interquartile range). All tests were two-sided, and statistical significance was defined as  $p < 0.05$ .

### Results

Our study cohort included 4,815 patients, of whom 2,763 (57.4%) had stage 3 CKD and 2,052 (42.6%) had stage 4 CKD. Patients with stage 4 CKD demonstrated significantly greater portal engagement compared to those with stage 3 CKD. Stage 4 patients reviewed more nephrology results (median 47 [IQR 86] versus 28 [IQR 46],  $p < 0.001$ ), initiated more message threads (median 11 [IQR 27] versus 7 [IQR 20],  $p < 0.001$ ), and had more total logins (median 167 [IQR 262] versus 128 [IQR 196],  $p < 0.001$ ). Median average time spent per session did not differ between groups (4.77 [IQR 3.38] versus 4.82 [IQR 3.29] minutes,  $p = 0.44$ ).

### Conclusions

Our findings suggest high portal utilization across stage 3 and 4 CKD; however, portal engagement increased with advancing disease severity. Although patients with stage 4 CKD engaged more frequently with their portal, they spent a similar amount of time per session as those with less advanced disease. Future interventions may leverage the portal to address disease management needs of patients with advanced CKD severity.

## **Abstract # 29**

**Title:** Kidney Transplant Recipients' Perceptions of Treatment Decision-Making After New Cancer Diagnosis

**Authors:** E. Breeding, M. Houston, P. Reese, A. Spann, T. French, D. Johnson, E. Gordon

### **Background**

Kidney transplant recipients experience higher rates of cancer due to required immunosuppression. After a post-transplant cancer diagnosis, recipients must decide whether to reduce immunosuppression to control cancer, risking organ rejection, or maintain immunosuppression, risking cancer progression. This study assessed kidney transplant recipients' experiences with cancer treatment decision-making following a post-transplant cancer diagnosis.

### **Methods**

We conducted semi-structured interviews via Microsoft Teams with kidney transplant recipients at Vanderbilt University Medical Center who had received a post-transplant cancer diagnosis, excluding skin cancer. Interviews included 48 open- and closed-ended questions assessing perceptions of treatment options, decision-making experiences, information needs, and communication with nephrologists and oncologists. We used descriptive statistics for quantitative data and thematic analysis for qualitative data.

### **Results**

Twenty kidney transplant recipients participated (43% participation rate). Most were female (70%), White (70%), with mean age of 62 years and median 11.5 years post-transplant. Many lacked awareness of the immunosuppression-cancer link, the option to reduce immunosuppression after diagnosis, and available treatment options. Most received a single treatment recommendation from their oncologist. Participants prioritized following their doctor's advice (50%), protecting the transplant and treating cancer equally (35%), protecting the transplant (15%), or treating cancer (0%). Some noted neither their oncologist nor nephrologist discussed reducing immunosuppression. Regarding decision-making, doctors made the final decision (35%), decisions were made equally with doctors (35%), or recipients decided independently (30%). Although 90% felt they had adequate information and 75% reported sufficient information about treatment effects on their transplant, most retrospectively desired more information about long-term side effects, treatment-transplant interactions, and alternative options. While 80% were not provided a decision aid, 65% would have used one.

### **Conclusions**

Kidney transplant recipients with cancer have limited understanding of immunosuppression's role in cancer treatment and desire more information about alternatives. Future research should promote shared decision-making between recipients, oncologists, and transplant nephrologists.

## Abstract # 30

**Title:** Shorter Time to Decannulation in Trauma Patients: Implications for Clinical Practice

**Authors:** Janavi Sethurathnam BS, Lauren Kelly MD, Robel Beyene MD, Andrew Medvecz MD, Elizabeth Krebs MD

### Introduction

Tracheostomy placement is a common intervention for patients requiring prolonged mechanical ventilation or with specific injuries. Current data from mixed ICU populations suggest prolonged ventilator dependence and prolonged time to decannulation following tracheostomy, yet little consensus exists regarding the anticipated duration of tracheostomy dependence among trauma patients. The objective of this study was to measure the time to decannulation in adult trauma patients. We hypothesized that certain factors are associated with earlier decannulation.

### Methods

A retrospective chart review was performed for all trauma patients undergoing tracheostomy at a US Level I trauma center between January 2021 and December 2023. Demographics, injury data, tracheostomy details, and dates of decannulation and/or death were recorded for up to a year after tracheostomy placement. Kaplan-Meier analysis evaluated time to decannulation. Patients were compared based on decannulation status at 6 weeks (42 days), using chi-square and Wilcoxon rank sum tests. A Fine-Gray competing risks regression analysis evaluated time to decannulation, accounting for the competing risk of death.

### Results

A total of 344 patients underwent tracheostomy during this time period, of whom 76% were decannulated, 10% died with tracheostomy, and 13% were lost to follow up. Notably, 144 (41%) were decannulated prior to discharge. On Kaplan-Meier analysis, median time to decannulation was 43 days, with 84% of surviving patients decannulated at 90 days. Patients decannulated at 6 weeks were younger (median age 38 vs. 48,  $p < 0.01$ ), less likely to be obese (6.8% vs 17.3%,  $p < 0.01$ ), had more upper airway injuries (14% vs 5%,  $p = 0.01$ ), had fewer spinal cord injuries of any level (8.8% vs 20.5%,  $p < 0.01$ ), and fewer cervical spinal cord injuries (4% vs 18%,  $p < 0.01$ ). At 6 weeks, decannulated versus still-cannulated groups had similarly high rates of traumatic brain injury (68% vs. 62%,  $p = 0.27$ ) and rib fractures (46% vs 57%,  $p = 0.07$ ). On multivariate analysis, age and cervical spinal cord injuries remained associated with later decannulation. Upper airway injury was associated with earlier decannulation.

### Conclusions

This single-center cohort of trauma patients was decannulated earlier than existing literature, with many being decannulated before discharge and the majority by 90 days. Tracheostomy does not preclude discharge home. Whether this suggests fewer tracheostomies are needed, or if tracheostomy is useful to accelerate patient care short-term, or both, remains unclear. Understanding decannulation patterns is essential for writing guidelines, providing informed discharge planning, and setting realistic expectations with patients and their families.

## **Abstract # 31**

**Title:** The Impact of Age on Long Term Quality of Life After Cancer Surgery

**Authors:** Peter Bryant, Run Fan, Yu Shyr, Myrick Shinall

### **Introduction**

Understanding predictors of diminished quality of life after a major operation is important to guide preoperative decision making, especially for older patients. While older patients may frequently have their age incorporated into decision making, there may be better predictors of post-operative quality of life.

### **Methods**

This study utilized data from the Surgery for Cancer with Option of Palliative Care Expert trial, which included patients undergoing major abdominal surgery for cancer and collected Functional Assessment of Cancer Therapy-General (FACT-G) scores as a measure of quality of life every 6 months up to three years post-operatively. We performed a linear mixed-effects model to compare quality of life outcomes for older (> 70 years) and younger (< 70 years) patients, controlling for frailty, receipt of chemotherapy or radiation during follow-up, type of cancer, sex, time from surgery, and pre-operative FACT-G scores.

### **Results**

A total of 207 patients were analyzed, including 65 (31.4%) patients 70 or older and 142 (68.6%) patients under 70. Older patients' longitudinal FACT-G scores did not differ significantly from those of younger patients (adjusted mean difference 2.7,  $p=0.17$ ). Pre-operative FACT-G score and receipt of chemotherapy or radiation during follow-up were significantly associated with post-operative FACT-G scores ( $p<0.001$  for both).

### **Conclusions**

When controlling for baseline quality of life and post-operative cancer therapy, age over 70 does not predict lower quality of life after a major abdominal surgery for cancer. Pre-operative quality of life rather than age should guide the assessment of older surgical patients' likely post-operative quality of life trajectory.

## Abstract # 33

**Title:** Body Composition Changes After Bariatric Surgery or Treatment With GLP-1 Receptor Agonists

**Authors:** Lei Wang, PhD\*; Zicheng Wang, MS\*; Xinmeng Zhang, BS; Brandon D. Lowery, BS; Lauren Lee Shaffer, MA; You Chen, PhD; Quinn S. Wells, MD; Charles R. Flynn, PhD; Brandon Williams, MD; Matthew Spann, MD; Gitanjali Srivastava, MD; Jason M. Samuels, MD\*; Danxia Yu, PhD\* (\*These authors contributed equally to this work. JS and DY are co-senior authors of this work.)

### Introduction

The association of bariatric surgery and newer glucagon-like peptide-1 receptor agonists (GLP-1RAs; semaglutide and tirzepatide) with body composition still lack evidence from clinical settings. In this study, we aimed to examine temporal changes in fat-free mass (FFM), fat mass (FM), and FFM to FM ratio after bariatric surgery or GLP-1RA treatment over 24 months.

### Methods

This retrospective cohort study used electronic health records from Vanderbilt University Medical Center of 1257 patients aged 18 to 65 years who underwent first-time bariatric surgery from November 21, 2017, to July 21, 2022, without GLP-1RA treatment from 1 year before to 2 years after surgery, and 1809 nonsurgical patients who started semaglutide or tirzepatide between November 12, 2018, and December 6, 2023, with 2 or more prescriptions or 5% or more weight loss. All patients had 2 or more bioelectrical impedance analysis measures and no history of end-stage kidney disease or congestive heart failure. Main Outcomes were relative changes in FFM, FM, and FFM to FM ratio over 24 months, controlling for age, sex, race, baseline body mass index (BMI), diabetes history, treatment year, time (restricted cubic splines), and time spline-by-treatment interaction.

### Results

The study comprised 3066 patients: 1257 in the surgery group (mean [SD] age, 43.4 [10.3] years; mean [SD] baseline BMI, 46.8 [7.1]; 1033 women [82.2%]) and 1809 in the GLP-1RA group (mean [SD] age, 45.4 [11.3] years; mean [SD] baseline BMI, 41.0 [7.9]; 1457 women [80.5%]). Adjusted mean relative FM reductions in the surgery group were 42.4% (95% CI, 41.5%-43.2%) at 6 months, 49.7% (95% CI, 48.8%-50.6%) at 12 months, and 49.7% (95% CI, 47.8%-51.5%) at 24 months; reductions in the GLP-1RA group were 10.3% (95% CI, 9.5%-11.0%) at 6 months, 17.3% (95% CI, 16.5%-18.1%) at 12 months, and 18.0% (95% CI, 16.4%-19.7%) at 12 months. Adjusted mean relative FFM reductions in the surgery group were 7.8% (95% CI, 7.2%-8.4%) at 6 months, 10.6% (95% CI, 10.0%-11.2%) at 12 months, and 11.7% (95% CI, 10.4%-12.9%) at 24 months; reductions in the GLP-1RA group were 1.8% (95% CI, 1.3%-2.4%) at 6 months, 3.0% (95% CI, 2.4%-3.5%) at 12 months, and 3.3% (95% CI, 2.1%-4.4%) at 24 months. FFM to FM ratios increased significantly in both groups, with surgical patients maintaining a higher ratio throughout: the FFM to FM ratios in the surgery group were 1.8 (95% CI, 1.8-1.8) at 6 months, 2.1 (95% CI, 2.1-2.1) at 12 months, and 2.0 (95% CI, 2.0-2.1) at 24 months; the FFM to FM ratios in the GLP-1RA group were 1.4 (95% CI, 1.4-1.4) at 6 months, 1.5 (95% CI, 1.4-1.5) at 12 months, and 1.5 (95% CI, 1.5-1.6) at 24 months. Similar trends were observed in stratified analyses by sex, race, baseline BMI, baseline diabetes status, and GLP-1RA treatment duration, although men showed better FFM preservation than women, especially after GLP-1RA treatment.

### Conclusions

In this single-center cohort study, both bariatric surgery and semaglutide or tirzepatide treatment were associated with substantial FM loss, moderate FFM loss, and improved FFM to FM ratio. These findings provide evidence to guide interventions aimed at preserving FFM while promoting fat loss.

## Abstract # 35

**Title:** Sagittal Split Osteotomy (SSO) Compared to Intraoral Vertical Ramus Osteotomy (IVRO) Performed With or Without the Use of a Surgical Guide - Which is the more efficient operation?

**Authors:** Long Zhang, Samuel J. McKenna, Kevin C. Galloway, Susie I. Lin

### Introduction

Recent development of an anatomically designed cutting guide at the Department of Oral and Maxillofacial Surgery has enabled IVRO to be performed with greater precision, potentially reducing complications such as inferior alveolar nerve (CN V3) injury and temporomandibular joint (TMJ) dislocation caused by unfavorable osteotomy. Traditionally, IVRO has been performed without a cutting guide or internal fixation, requiring a period of postoperative maxillomandibular fixation (MMF). MMF is associated with patient discomfort, anxiety, and potential airway concerns. Since 2018, two surgeons at VUMC have routinely performed IVRO with internal fixation to mitigate the need for postoperative MMF.

The aims of this study were to 1) evaluate whether the use of an IVRO cutting guide reduces operative time, and 2) compare operative times between IVRO with internal fixation and sagittal split osteotomy (SSO).

### Methods

A prospective study was conducted on patients who underwent IVRO or SSO from January 2024 to December 2025. Subjects were divided into three groups: 1) IVRO performed with the use of a cutting guide (IVRO-CG), 2) IVRO performed without the use of a cutting guide (IVRO-noCG), and 3) SSO. Outcome variables including the time required for surgical exposure, completion of osteotomy and internal fixation were compared among the study groups. A multivariate regression model was used for statistical analysis.

### Results

Thirty subjects with sixty observations (24 IVRO-CG, 18 IVRO-noCG, 18 SSO) were studied. The mean osteotomy time in minutes was 11.747.0 (IVRO-CG), 16.547.8 (IVRO-noCG), and 43420.2 (SSO). The mean osteotomy time for IVRO-noCG was 41% longer compared to the osteotomy time for IVRO-CG ( $p < 0.05$ ). Compared with IVRO-CG, SSO required 72% longer dissection time ( $P < 0.001$ ) and 3.8 times longer osteotomy time ( $p < 0.001$ ). No differences were observed in the time required for internal fixation.

### Conclusions

The use of a cutting guide significantly reduces osteotomy time during IVRO. IVRO performed with or without a cutting guide demonstrated shorter operative times compared to SSO. IVRO with internal fixation represents an efficient and viable alternative to SSO in orthognathic patients requiring mandibular setback and minor advancement.

## Abstract # 36

**Title:** Incidence of Major Adverse Cardiovascular Events in Patients with Two-Vessel and Single-Vessel Normal Ankle-Brachial Indices

**Authors:** Andre Hall, BS; Sanjana Borle, BS; Praveen Vimalathas, MD; Punit Vyas, MD; Nikith Kurella, BS; Patrick Stone, MD

### Introduction

Peripheral artery disease (PAD) is an accumulation of arterial plaque primarily affecting the lower extremities. The presence of PAD portends increased cardiovascular morbidity, mortality, and adverse events. PAD is diagnosed using ankle brachial index (ABI), the ratio between leg and arm blood pressures. A normal ABI is defined as a ratio of  $\geq 0.9$  from at least one of the two ankle vessels, posterior tibial (PT) and dorsalis pedis (DP) arteries; meanwhile, an abnormal ABI requires a ratio of  $< 0.9$  in both vessels of the same leg. This classification does not account separately for individuals with single-vessel disease, who also likely suffer from an overall increased atherosclerotic burden, despite being labeled as normal. We predict that individuals with only one-vessel normal ABI demonstrate higher rates of myocardial infarction, stroke, cardiovascular death, and overall major adverse cardiovascular events (MACE) as compared to individuals with two-vessel normal ABIs.

### Methods

Chart data was retrospectively collected from adult patients at Vanderbilt University Medical Center who received an ABI measurement between 11/1/2017 and 8/30/2020. The incidence of myocardial infarction (MI), stroke, and cardiovascular death after each patient's ABI measurement was collected, and a composite 3-point MACE was defined as MI, stroke, or cardiovascular death. True normal ABI was defined as both DP and PT ABI  $\geq 0.9$ , and single-vessel normal ABI was defined as only one vessel ABI  $\geq 0.9$ .

### Results

The study population included 609 patients, 518 with true normal ABI and 91 with single-vessel normal ABI. The incidence of overall MACE was 24.2% (22/91) in the single-vessel normal population, compared to 12.9% (67/518) in the true normal population. Stratifying by event type for single-vessel normal and true normal populations, the incidence of myocardial infarction was 12.1% (11/91) and 7.1% (37/518) respectively; incidence of stroke was 13.2% (12/91) and 4.2% (22/518) respectively; and incidence of cardiovascular death was 4.4% (4/91) and 2.9% (15/518) respectively.

### Conclusions

The incidence of MACE was observed to be greater in patients with one-vessel normal ABI: compared to patients with two-vessel normal ABIs, as predicted. Patients with only one-vessel normal ABI in a given leg may benefit from a distinct categorization, separate from normal ABI, to reflect atherosclerotic burden and future cardiovascular risk. Our data from this preliminary descriptive study supports the need for further investigation, as differences are observed. However, as our study groups are unmatched, data stratification with propensity matching and further statistical analyses may better characterize these findings.

## **Abstract # 37**

**Title:** Young and Aggressive: Predictors of Incomplete Pathologic Response in Early-Onset Rectal Cancer

**Authors:** Maryam Sherwani, Danish Ali, Phillip J. Williams, Hanjoo Lee, Aimal Khan, Michael B. Hopkins

### **Introduction**

Early-onset rectal cancer (EoRC) is rising. Clinical complete response, a surrogate for pathologic complete response, is used to identify patients eligible for a nonoperative wait-and-watch protocol, while incomplete pathologic response (iPR) may warrant caution. This study aims to identify factors associated with iPR in EoRC.

### **Methods**

This retrospective cohort study utilized data from the National Cancer Database (2018-2022) on patients aged 18-49 years diagnosed with primary locally advanced rectal adenocarcinoma who received neoadjuvant therapy. Patients not undergoing surgery or with incomplete surgical data or tumor staging were excluded. Multivariable logistic regression was used to determine the predictors of iPR.

### **Results**

Our study included 6,344 patients, among which 5,180 (81.7%) did not achieve pCR. Patients with iPR had a lower 5-year overall survival compared to patients with pCR (83.3% vs. 96.3%,  $p < 0.001$ ). On multivariable analysis, the presence of mucinous histology (OR 3.24, 95%CI=1.64-6.41), cT4 stage compared to cT1 (OR 2.06, 95%CI=1.01-4.17), cN2 stage compared to cN0 (OR 1.36, 95%CI=1.12-1.65), lymphovascular invasion (OR 1.76, 95%CI=1.37-2.25), isolated radiotherapy compared to total neoadjuvant therapy (OR 1.88, 95%CI=1.13-3.15), and governmental insurance compared to private (OR 1.30, 95%CI=1.09-1.56) were all associated with iPR. Conversely, a longer interval between the conclusion of neoadjuvant therapy and surgery was associated with lower odds of iPR (OR 0.99, 95%CI=0.99-0.99).

### **Conclusions**

Aggressive tumor characteristics are associated with iPR in EoRC. Given that tumor characteristics are most accurately assessed following resection, caution should be exercised when enrolling young patients with rectal cancer in nonoperative management protocols.

## **Abstract # 38**

**Title:** Cost Analysis in Thyroid Cancer Clinical Trials: Toward Value-Based Oncology Care

**Authors:** Sebastian Henostroza, James Rogers, Adam Fahey, Carmen C. Solórzano

### **Background**

Thyroid cancer is among the most rapidly increasing cancers in the United States, with over 44,000 new cases annually. While most patients experience excellent survival, treatment options have expanded to include costly surgical, radiologic, and systemic therapies. Value-based care emphasizes delivering optimal patient outcomes at the lowest possible cost, shifting the focus from volume of services to overall value. However, the integration of cost considerations in thyroid cancer research remains limited. This study characterizes thyroid cancer clinical trials reporting cost-related outcomes to quantify their prevalence and identify gaps in high-value care research.

### **Methods**

A systematic search of ClinicalTrials.gov was conducted for trials from inception through 2025 using “Thyroid Cancer” and “Cost” as primary search parameters. Related terms were automatically generated to ensure a comprehensive database search. Trials were included if cost was mentioned in the description or listed as a specific study outcome, verified via manual search. Cost outcomes were defined as the direct and indirect expenses of trial interventions rather than administrative operating costs. Data regarding trial status, funding, geographic origin, and the categorization of cost as a primary, secondary, or exploratory endpoint were collected and analyzed.

### **Results**

Among 1,196 thyroid cancer-focused trials identified, only 28 (2.3%) incorporated cost in any capacity. Within this subset, cost was a primary outcome in only 1 trial (4%), a secondary outcome in 20 (71%), and an exploratory or descriptive outcome in 7 (25%). Median enrollment for these trials was 290 participants. Geographically, France had the highest proportion of cost-focused trials (29%), while the United States contributed only 7%. Interventional trials comprised 89% of the cohort, focusing primarily on surgery (40%), radiation therapy (32%), and imaging (20%). Funding was 96% academic or institutional; industry sponsorship accounted for 4%, while zero trials were supported by the National Institutes of Health (NIH).

### **Conclusions**

These results illustrate a profound lack of investigation into economic endpoints within thyroid cancer clinical trials. Most cost-related data are limited to secondary or exploratory analyses, hindering the ability of clinicians and policymakers to assess the value of emerging therapies. Given that long-term surveillance and recurrent interventions contribute substantially to the lifetime cost of care, the total absence of NIH-funded economic research reflects a significant misalignment between research priorities and rising healthcare expenditures. Increased investment is essential to align clinical trial design with the goals of sustainable, patient-centered oncology care.

## Abstract # 39

**Title:** Major Adverse Limb Events in Patients with Discordant Ankle Brachial Index

**Authors:** Sanjana Borle, BS; Andre Hall, BS; Punit Vyas, MD; Praveen Vimalathas, MD; Nikith Kurella, BS; Patrick Stone, MD

### Introduction

The ankle brachial index (ABI) is a noninvasive tool that compares lower extremity (LE) and brachial blood pressures to diagnose and monitor peripheral arterial disease (PAD). Blood pressures are measured in bilateral dorsalis pedis (DP) and posterior tibial (PT) arteries; a ratio  $<0.9$  in both vessels of at least one leg is considered abnormal and diagnostic of PAD. The degree of ABI deviation from 0.9 is also a useful indicator of overall PAD burden, and can be used to monitor the likelihood of future major adverse limb events (MALE). Since, by definition, an abnormal ABI is characterized by 2 vessel disease, there exists a subgroup of patients who are categorized as normal but have abnormal readings in precisely one artery in either or both legs. It remains unknown whether this group has an increased need for operative intervention or eventual amputation, when compared to individuals with normal ratios in all four LE vessels. We hypothesize that patients with discordant but clinically normal ABI will have more MALEs compared to patients with ABI readings  $\geq 0.9$  in all four measured vessels.

### Methods

This retrospective chart review study included 1045 patients who received an ABI from 2017-2020 at Vanderbilt University Medical Center. Patients with pre-ABI limb revascularizations, amputation, and a history of heart transplant were excluded. Ultimately, 91 patients were included in the "Questionable Normal" group, defined as individuals with ABI ratio of  $<0.9$  in either DP or PT arteries, present in one or both LEs. 518 patients were included as "True Normal"; these patients had ratios  $\geq 0.9$  in all four LE vessels. The primary endpoint of interest, MALE, included any limb revascularization procedure or LE amputation performed after the ABI.

### Results

Of the 91 Questionable Normal patients, 8 patients (8.79%) had at least one MALE reported after ABI measurement, compared to 23 of the 518 True Normal ABI patients (4.44%). Specifically, the Questionable Normal group had 4 (4.40%) revascularizations and 4 (4.40%) LE amputations, whereas the True Normal group contained 13 (2.51%) revascularizations and 11 (2.12%) LE amputations.

### Conclusions

As hypothesized, patients with standalone ABI ratios of  $<0.9$  in either or both legs had a higher rate of MALEs compared to those with normal ABI ratios in all 4 vessels. Thus, the presence of a standalone abnormal ratio, despite current categorization as normal, may help to further stratify patients who are at increased risk of MALEs. Further analyses which control for age, sex and comorbidities are warranted to identify if a standalone abnormal ratio does indeed characterize a higher risk subgroup. If so, this group may benefit from additional pharmacotherapy similar to treatments currently recommended for PAD.

## **Abstract # 40**

**Title:** Saving Face: The Duration of Prophylactic Antibiotics Matters in Ballistic Mandibular Fractures

**Authors:** Stephen P. Gadowski, Elizabeth D. Krebs, Jennifer R. Beavers, Melissa D. Smith, Eric H. Mace, Bradley M. Dennis, Jill R. Streams

### **Introduction**

Ballistic facial fractures are at high risk for infection due to bony and/or soft-tissue destruction, contamination from oropharyngeal flora, and environmental exposure. Lacking definitive data, recommendations for prophylactic regimens vary from 24 hours to 7 days. We evaluated the relationship between antibiotic administration and infectious complications in ballistic mandibular fractures.

### **Methods**

This is a retrospective cohort study from a Level 1 trauma center of patients admitted with a ballistic mandibular fracture from January 2020 to December 2025. Patients were excluded if they had an infection present on admission or never received antibiotics. Data collected included age, time to antibiotic exposure (including face-specific coverage), time to first operation, number of operations, duration of antibiotic exposure, and development of infection. Using univariate and multivariate logistic regression analyses, we evaluated the relationship between antibiotic exposure, operative intervention, and infection.

### **Results**

108 patients met inclusion criteria. 89% of patients underwent surgery with a median time to OR of 2 d [IQR 1-3], median time to facial antibiotic prophylaxis 4 hrs [IQR 2-9.8], and median duration of antibiotic exposure 81 hrs [IQR 32-219]. 28 (25.9%) patients developed an infection. On univariate analysis, there was an inverse association between duration of antibiotic exposure and development of infection ( $p = 0.003$ ). There was no correlation between infection and time to any antibiotic administration ( $p = 0.158$ ), time to face antibiotic coverage ( $p = 0.147$ ), or time to operation ( $p = 0.104$ ). On multivariate analysis, higher cumulative duration of antibiotic exposure was associated with a decrease in infections (OR 0.993, 95% CI 0.988-0.998) while time to antibiotics and time to OR were not.

### **Conclusions**

Infectious complications of ballistic mandible fractures are common. In our cohort, we found that extended antibiotic prophylaxis was associated with a reduction of infectious complications suggesting that a shorter duration of prophylaxis may be insufficient.

## Abstract # 41

**Title:** Risk for metachronous tumors and renal insufficiency in cases of sporadic, unilateral, multicentric Wilms tumor

**Authors:** Callie Frey, BA; Heidi Chen, PhD; Daniel Benedetti, MD, MA; and Harold N. Lovvorn, III, MD; On behalf of the WILMs Collaborative

### Introduction

Presentation with or predisposition to bilateral Wilms tumor ("PreMu-WT") poses unique challenges in balancing oncologic outcomes with kidney preservation. For children with PreMu-WT, neoadjuvant chemotherapy and nephron-sparing surgery (NSS) represent the standard of care. However, for sporadic, unilateral but multicentric WT ("SUniMu-WT"), optimal treatment remains controversial given uncertain risks for metachronous tumors and subsequent renal insufficiency. The aim of this study was to compare rates of metachronous tumors and renal insufficiency among children with WT.

### Methods

A research collaborative comprising 14 institutions analyzed oncologic outcomes and the development of renal insufficiency between SUniMu-WT, PreMu-WT and sporadic, unilateral, unicentric WT ("SUni2-WT") groups. Descriptive statistics were performed for standard patient and disease characteristics. Categorical and continuous variables were evaluated using Pearson's Chi-Squared and Kruskal-Wallis tests. Four-year and actuarial metachronous-free, relapse-free, and overall survival analyses were completed applying Kaplan-Meier methods.

### Results

This cohort (n=1200; age <18y) comprised 874 (72.8%) SUni2-WT, 251 (20.9%) PreMu-WT, and 75 (6.3%) SUniMu-WT. No difference emerged between groups regarding sex (56% female, p=0.26) or race (63% white, 19.3% black; p=0.24). PreMu-WT presented at younger median age (26 [13-44] months) than SUni2-WT (41 [24-65] months) and SUniMu-WT (46 [32-62] months; p<0.001). NSS was performed in 51.6% of PreMu-WT, 8.0% of SUniMu-WT, and 1.5% of SUni2-WT (p<0.001). Unfavorable histology (UH) occurred similarly between PreMu-WT (13.3%) and SUniMu-WT (12.0%), compared to SUni2-WT (7.3%; p=0.011). SUniMu-WT and SUni2-WT showed similar frequencies of lymph node involvement, positive margins, and tumor spill. Nephrogenic rests were present in 72% of PreMu-WT, 56% of SUniMu-WT, and 21.9% of SUni2-WT (p<0.001). Eight patients with PreMu-WT (3.3%) developed metachronous tumors relative to none with SUniMu-WT (p<0.001). Further, patients with PreMu-WT showed reduced metachronous-free (p<0.001), relapse-free (p=0.0077), and overall survival (p<0.001), and increased need for dialysis (6.6%; p<0.001) and kidney transplant (4.5%; p=0.016).

### Conclusions

SUniMu-WT showed increased incidences of nephrogenic rests, UH, and relapse rates relative to SUni2-WT. Further, no patients with SUniMu-WT developed metachronous tumors or significant risk for renal insufficiency as observed with PreMu-WT. Taken together, optimal therapy for patients with SUniMu-WT should include upfront total nephrectomy when feasible without prioritizing NSS strategies.

## **Abstract # 42**

**Title:** Standardization of International Diverticular Disease Definitions

**Authors:** Fahey AL, K Zarni, Lawday S, Hawkins AT, Lee M, Vimalachandran D

### **Background**

Diverticular disease is a heterogeneous entity that encompasses diverticulosis and its various complications. Despite increasing prevalence of diverticular disease globally, there remains a lack of agreement in the definitions of diverticular disease. This study obtained consensus on definitions of the disease processes in diverticular disease among medical experts worldwide.

### **Methods**

This is a cross-sectional survey. The research team developed initial definitions through a search of PubMed studies. Definitions were further refined through extensive beta testing, resulting in preliminary definitions for the survey. The survey was distributed to global experts via snowball methodology to achieve consensus. Participants were given the option to provide feedback via free text on a definition if they disagreed with it. Based on prior definition consensus studies, an 80% agreement threshold was used to reach consensus for each definition. Demographic data was also collected from respondents at the end of the survey.

### **Results**

Two hundred and seven responses were received following survey distribution. Based on the results of the definition surveys, each proposed definition met consensus agreement. The median years of practice among respondents was 12 years. Most identified as surgical physicians (n=178, 87.3%), with 23 (11.3%) identifying as medical physicians and 3 (1.5%) identifying as other allied health professionals. The most represented countries amongst respondents were the United States (n=100, 49.0%), the United Kingdom (n=65, 31.9%), and Canada (n=13, 6.4%).

### **Conclusions**

The results of this survey revealed consensus from various healthcare providers across the world, indicating significant agreement. Some definitions had higher consensus agreement than others, revealing a potential need to investigate the nuances of certain definitions further. These standardizations of common diverticulitis terms will enhance both clinical care and research.

## Abstract # 43

**Title:** Management and outcomes of isolated variant lobular carcinoma in situ: A single-institution experience

**Authors:** Taylor St. Amour MD, Cecilia Pesavento MD, Kristina Shaffer MD FACS

### Introduction

Lobular carcinoma in situ (LCIS) is a marker of increased breast cancer risk and a non obligate precursor of invasive carcinoma. Classic LCIS is most common, with an incidence of 0.5–4%. Variant LCIS (vLCIS), including pleomorphic (pLCIS) and florid (fLCIS) subtypes, is less frequent but associated with higher rates of upgrade to invasive carcinoma. Because isolated vLCIS is rare, most published data include cases with concurrent invasive disease, limiting understanding of its natural history and optimal management. Current guidelines recommend excision of vLCIS identified on biopsy, though the appropriate negative margin width remains undefined. Some advocate management analogous to ductal carcinoma in situ (DCIS) using  $\geq 2$  mm margins, despite limited supporting evidence. This study aimed to characterize clinicopathologic features, management, and outcomes of isolated vLCIS. We hypothesized that recurrence following excision would be uncommon and not correlated with margin width.

### Methods

A single institution retrospective review was performed of patients diagnosed with isolated vLCIS between January 2010 and July 2025 at a tertiary referral center. Patients with concurrent ipsilateral invasive carcinoma or DCIS were excluded. Collected variables included age, variant subtype, imaging findings, surgical management, margin status, endocrine chemoprevention use, and clinical outcomes. Follow up data were obtained from medical records, and descriptive statistics were used.

### Results

Sixteen patients met inclusion criteria. Age ranged from 39–76 years (median 62.5); 3 patients (18.7%) were premenopausal and 13 (81.3%) postmenopausal. Median follow up was 27.5 months (range 1–89). Fifteen patients (93.8%) underwent surgical excision; 1 pursued imaging surveillance. Among surgical patients, 12 (80%) underwent lumpectomy and 3 (20%) mastectomy. Final pathology demonstrated fLCIS in 6 patients (40%) and pLCIS in 9 (60%). Residual vLCIS extent was reported in 8 patients and ranged from 0.4–67 mm (median 27.5). Five patients (31.3%) received endocrine chemoprevention (median duration 24 months). Among surgically treated patients, margins were  $< 2$  mm in 4 (26.7%), including 2 with positive margins (13.3%),  $> 2$  mm in 6 (40.0%), and unknown in 5 (33.3%). No re excisions were performed. Four patients (26.7%) had invasive lobular carcinoma (ILC) and 1 (6.7%) had DCIS on final pathology; all margins were  $> 2$  mm for these lesions. One patient (6.7%) developed ipsilateral ILC 37 months postoperatively; this patient had  $< 2$  mm margins and did not receive chemoprevention.

### Conclusions

In this single institution series, isolated vLCIS was typically managed with surgical excision, and recurrence was rare over a median follow up of 27.5 months, regardless of margin width. Although limited by small sample size, these findings suggest that isolated vLCIS without associated malignancy may not require margins  $> 2$  mm as recommended for DCIS. Larger studies are needed to establish evidence based margin guidelines for vLCIS.

## Abstract # 44

**Title:** Not All Variables Are Created Equal: Stratifying NSQIP Elements for AI Automation

**Authors:** Luke S. Jones, BS, Hudson M. Holmes, MD, Yash Trivedi, BS, Barbara Martin, RN, MBA, Sherree Levering, RN, Daniel Fabbri, PhD, Carly Eckert, MD, PhD, Kevin Sexton, MD, Eunice Y. Huang, MD, MS

### Introduction

Surgical registries transform complex clinical narratives into standardized data elements for outcomes evaluation, but this process is costly and creates inter-abstractor variability. Generative Artificial Intelligence (AI) can process clinical narratives with uniform application of abstraction rules. We evaluated an AI tool for automated generation of ACS National Surgical Quality Improvement Program (NSQIP) data elements to determine which variables are best suited for full automation, hybrid human-AI verification, or manual abstraction.

### Methods

Brim Analytics, an AI-powered chart abstraction platform, extracted 9 variables from patient records at a single institution. Abstraction logic for each variable was developed using AI-assisted interpretation of the ACS NSQIP Participant Use Data File data dictionary, with all variable definitions and decision rules manually reviewed by trained clinical reviewers prior to deployment. AI-generated values were then compared against independent manual abstraction by trained NSQIP clinical reviewers, which served as the gold standard. Using sensitivity and PPV, variables were categorized into four abstraction strategies: 1) direct structured query 2) autonomous AI abstraction 3) AI abstraction with registrar verification 4) human abstraction.

### Results

We analyzed 9 of 150+ NSQIP variables of differing complexity, across 139 patient records: manual abstraction required 69.5 hours versus 1.2 hours using Brim. Two variables (diabetes mellitus, hypertension requiring medication) with high sensitivity and PPV (100%, 100%) supported autonomous AI extraction; four (ascites, superficial SSI, bleeding disorder, unplanned reintubation) with high sensitivity but low PPV (100%, 30%) were suited for AI screening with registrar verification of flagged positives; three (chronic opioid use, readmission within 30 Days, COPD diagnosis) with low sensitivity (67%) required manual abstraction due to unacceptable miss rates.

### Conclusions

Currently, AI can automate extraction of some registry variables. Variables requiring temporal reasoning, integration of multiple data sources, severity thresholds, and clinical judgement appear most suitable for manual abstraction. An augmented abstraction framework could improve registrar efficiency with variable complexity informing AI implementation. Further work is needed to evaluate prospective use of this framework in registry workflows.

## **Abstract # 45**

**Title:** Applying the Technology Acceptance Model 2 Framework to Evaluate an AI Tutor for Surgical Education

**Authors:** Sarah Zeng, Kevin Sexton MD, Carly Eckert MD, PhD, MPH

### **Introduction**

In the evolving landscape of surgical education, individualized learning, competency-based assessment, and data-driven feedback increasingly supplement traditional faculty-led training. Their importance for trainee proficiency has emerged from challenges including variable mentorship and limited operative exposure. Artificial intelligence (AI) is a promising adjunct, offering adaptive curricula, personalized feedback, and structured progress tracking. However, the success of AI tools depends not only on technical performance but also on adoption by learners. The Technology Acceptance Model 2 (TAM2) is a widely used framework for understanding technology adoption. Although typically applied after deployment, TAM2 constructs may also provide a structured method for assessing adoption readiness prior to implementation. This study investigates the feasibility of applying TAM2 as a pre-deployment evaluation framework for an AI-based surgical education tutor.

### **Methods**

The AI tutor was prompted to generate clinical cases using the Surgical Council on Resident Education (SCORE) general surgery curriculum. Scenarios reflected topics commonly encountered by first year general surgery residents preparing for the ABSITE. Multiple interaction types were generated for each scenario to simulate learner behaviors, including clarification requests and incorrect reasoning. These structured test scenarios approximated resident study interactions rather than full conversational sessions. Tutor outputs and the application user interface (UI) were evaluated using a structured rubric derived from operationalized TAM2 constructs: perceived usefulness (PU), perceived ease of use (PEOU), job relevance (JR), output quality (OQ), and result demonstrability (RD).

### **Results**

Evaluation suggested strengths in PEOU through voice and text interaction modalities and RD through structured summaries and dashboard metrics of knowledge progress over time. PU and JR were demonstrated through targeted follow-up learning suggestions and mapping of conversation topics' ICD-10 codes to SCORE topics. OQ was reflected in accurate use and pronunciation of surgical terminology and abbreviations.

### **Conclusions**

Operationalizing TAM2 constructs as a pre-deployment framework provides a structured method for assessing whether new technologies are designed with end user needs in mind. In a rapidly expanding landscape of AI-driven educational tools, this approach may help identify critical features early in development and reduce the risk of underutilization. Future work will incorporate user studies of different training levels to evaluate additional TAM2 constructs and explore extension of the model for adoption within complex, multi-stakeholder academic medical environments.

## Abstract # 47

**Title:** Adverse Events Associated With the ExoSeal Femoral Arterial Closure Device: A MAUDE Database Analysis

**Authors:** Paul Soliman, Nikith Kurella, Luke Jones, Andrew Marsala

### Introduction

The Manufacturer and User Facility Device Experience (MAUDE) database is a reporting system developed by the Food and Drug Administration that allows for voluntary reporting of adverse events associated with medical devices. Although analyses of MAUDE data have been conducted for several commonly used arterial closure devices, an evaluation of the ExoSeal femoral arterial closure system has not yet been reported. Therefore, the present study assessed the frequency and types of reported adverse events associated with the ExoSeal femoral arterial closure device (EX; Cordis Corporation, Miami Lakes, Fla).

### Methods

The MAUDE database was queried for reports involving EX from February 1, 2025, to February 1, 2026. A keyword-based search strategy was used to identify reports containing the following terms: (1) largest French sheath size, (2) hematoma, (3) hemorrhage, (4) thrombosis, (5) surgical cutdown, and (6) manual compression. Flagged reports were manually reviewed and modes of device failure were collected and categorized. Statistical analysis was conducted with Chi squared tests.

### Results

The MAUDE query identified 1,447 unique reports involving the EX device, including 615 with a 5F sheath, 477 a 6F sheath, 309 a 7F sheath, and 30 an 8F sheath. Failed deployment was reported in 682 cases (47.1%) and component detachment in 169 (11.6%). Manual compression was required in 1,033 cases (71.4%), whereas surgical cutdown was reported in 2 cases (0.1%). A total of 17 adverse vascular events (1.2%) were identified, including 7 hematomas (0.5%), 4 thromboses (0.3%), and 6 hemorrhages (0.4%).

When stratified by sheath size, failed deployment occurred in 50.2% of 5F cases, 39.2% of 6F cases, 51.1% of 7F cases, and 56.7% of 8F cases. Component detachment occurred in 10.4%, 16.1%, 7.4%, and 16.7%, respectively. Hemorrhage rates were 0.16%, 0.21%, 1.6%, and 0%, while manual compression was reported in 66.5%, 75.7%, 72.8%, and 86.7% of cases. Chi-square analysis, excluding the 8F sizing due to limited sample size, demonstrated significant differences across sheath sizes for failed deployment ( $p < 0.001$ ), component detachment ( $p < 0.001$ ), hemorrhage ( $p = 0.007$ ), and manual compression ( $p = 0.003$ ).

### Conclusions

Our findings suggest that the ExoSeal arterial closure device demonstrates a low incidence of clinically significant adverse vascular events in the MAUDE database. However, device failure, hemorrhage, and the need for manual compression varied significantly by sheath size. Hemorrhagic complications were most frequently reported in 7F sheath procedures and larger sheath sizes were associated with higher rates of failed deployment and manual compression. These findings highlight potential technical considerations when utilizing the ExoSeal device across different sheath sizes.

## **Abstract # 48**

**Title:** Developing and Evaluating an Interactive Case-Based Learning Platform for EMS Clinical Decision-Making

**Authors:** Logan D. Pasquariello, Carly M. Eckert, MD, PhD, Dana Knueven, MPH, PM-CC, I/C, Kevin W. Sexton, MD

### **Introduction**

Maintaining EMS clinical decision-making skills outside formal training environments remains a persistent challenge. While classroom instruction and simulation labs provide foundational knowledge, EMS learners have limited opportunities for repeated exposure to the cognitive demands of real-world decision-making. A validated AI-based clinical education platform was adapted to address this gap while incorporating EMS-specific training requirements. We sought to 1) configure the platform to incorporate realistic EMS clinical workflows, assessments, and operational constraints, and 2) evaluate its relevance and training utility for EMS education.

### **Methods**

The platform delivers interactive case-based scenarios through a speech-to-text interface with adaptive branching logic requiring learners to perform assessments, request findings, and initiate interventions in real time. Scenarios reflected common EMS medical and trauma presentations in realistic prehospital environments. Standard EMS assessment frameworks, protocol-driven interventions, and scope-of-practice limitations were incorporated. A structured evaluation framework assessed fidelity to EMS workflow, accuracy of assessment terminology and interventions, operational constraints, and the platform's ability to drive clinical reasoning. The tool was tested across multiple scenarios and reviewed against this framework.

### **Results**

Evaluation demonstrated that the adapted platform can realistically simulate prehospital decision-making while capturing key elements of EMS clinical workflow and operational context. Strong alignment was observed with core EMS workflow elements including dispatch progression, structured assessment sequences, scene safety considerations, scope-appropriate interventions, reassessment during care and transport, structured handoff, and professional communication. Moderate alignment was observed in clinical reasoning development, checklist-based skill evaluation, and learner progression tracking. Limitations included inconsistent recognition of time-critical conditions requiring system activation and limited dynamic patient condition changes during scenarios.

### **Conclusions**

An AI-based educational platform can deliver realistic case-based EMS training, offering a scalable modality for reinforcing prehospital clinical reasoning outside traditional classroom environments. By simulating operational constraints and protocol-driven decision pathways, the platform may help bridge gaps in experiential learning and ongoing skills maintenance. Future development should focus on expanding team dynamics, increasing scene complexity, and incorporating time-to-intervention considerations, followed by prospective validation with EMS trainees and practicing providers.

## Abstract # 49

**Title:** Adverse Events Associated With the Mynx Control Femoral Arterial Closure Device: Analysis of the FDA MAUDE Database

**Authors:** Nikith Kurella, Paul Soliman, Luke Jones, Andrew Marsala

### Introduction

Arterial closure devices are widely used to achieve hemostasis following femoral arterial access procedures. The FDA Manufacturer and User Facility Device Experience (MAUDE) database collects voluntarily submitted reports of adverse events associated with medical devices. Although analyses of MAUDE data have been conducted for several commonly used arterial closure devices, an evaluation of the Mynx Control femoral arterial closure system has not yet been reported. Therefore, the present study aims to assess the frequency and types of reported adverse events associated with the Mynx Control femoral arterial closure device (MX).

### Methods

The MAUDE database was queried for reports involving MX from September 11, 2024, to January 7, 2026. Reports were systematically reviewed for the following clinical outcomes: (1) largest French sheath size, (2) hematoma, (3) hemorrhage, (4) thrombosis, (5) surgical cutdown, and (6) manual compression. All flagged reports were independently reviewed, and device failure modes were additionally documented and categorized. Statistical analysis was conducted with Chi-squared tests. Due to the small sample size ( $n=2$ ), the 8F sheath group was excluded from chi-square analyses.

### Results

The MAUDE query identified 544 unique MX adverse event reports, including 281 involving a 5F sheath, 54 a 6F sheath, 201 a 7F sheath, and 2 an 8F sheath. Failed deployment was reported in 99 cases (18.2%) and component detachment in 80 (14.7%). Manual compression was required in 287 cases (52.8%), whereas surgical cutdown was reported in 6 cases (1.1%). A total of 27 adverse vascular events (5.0%) were identified, including 14 hematomas (2.6%), 11 thromboses (2.0%), and 7 hemorrhages (1.3%). When stratified by sheath size, failed deployment occurred in 17.4% of 5F cases, 33.3% of 6F cases, 14.9% of 7F cases, and 0% of 8F cases. Component detachment occurred in 18.5%, 7.4%, 11.4%, and 50.0%, respectively. Hemorrhage rates were 0%, 0%, 3.5%, and 0%, while manual compression was reported in 50.5%, 70.4%, 51.2%, and 100% of cases. Chi-square analysis demonstrated significant differences across sheath sizes for failed deployment ( $p = 0.007$ ), component detachment ( $p = 0.027$ ), hemorrhage ( $p = 0.003$ ), and manual compression ( $p = 0.024$ ).

### Conclusions

The Mynx Control arterial closure device was associated with a low incidence of clinically significant adverse vascular events in the MAUDE database. Nevertheless, device failure, hemorrhage, and manual compression differed significantly across sheath sizes. Hemorrhagic complications were exclusively reported in 7F sheath procedures, while 6F procedures had the highest rates of failed deployment and manual compression. These results underscore the importance of sheath size selection when deploying the Mynx Control device.

## **Abstract # 50**

**Title:** Multi-Institutional Review of the Efficacy of BESST Leadership Course in Teaching Leadership Competencies

**Authors:** Clare Lipscombe, MD, Alejandro Chara, Emily Witt, Michael Kochis, Alyssa Pradarelli, Irene Zhang, Colleen Kiernan, Robert Sinyard, MD

### **Introduction:**

Becoming Effective Senior Surgical Trainees (BESST), a previously described leadership development curriculum currently undergoing evaluation via a multi-institutional multi-year trial, may offer insight into how surgical trainees are conceptualizing their non-technical skill development. The purpose of this study was to analyze the written goals set by trainees participating in the program to inform curricular development and trainee evaluation strategies.

### **Methods**

Four participating institutions were invited to contribute post-course data from trainees who had completed the four sessions of the BESST curriculum between 2022-2025. Post-course feedback and goals were captured via anonymous REDCap survey. Qualitative responses were analyzed inductively using thematic analysis.

### **Results**

Three institutions provided post-course survey results for a total of 42 participants, 39 (93%) of whom had established explicit goals for their non-technical and leadership skill development by the conclusion of the course. Four dominant themes were identified among the written goals: building a team culture characterized by truthful communication, normalizing failure, 'getting in the trenches' with junior residents, and setting explicit performance expectations. 38 (90%) participants considered the course a good use of their protected didactic time though 17 (40%) still expressed considerable anxiety about their abilities to appropriately lead teams as rising senior residents.

### **Conclusions**

Surgical trainees transitioning to senior roles perceive dedicated time for non-technical skill development as valuable and most participants utilized course themes to set meaningful goals for their performance as team leaders. These findings should guide educators developing further curricula to train and evaluate senior surgical trainees regarding performance in these domains.

## Abstract # 51

**Title:** Is Systemic Anticoagulation Necessary During Intraoperative V-A ECMO for Bilateral Lung Transplantation? A Feasibility Study Comparing Zero-, Low-, and High-Intensity Heparin Strategies.

**Authors:** Enock Adjei, MD, Amir Teimouri Dereshgi, MD, John W. Stokes, MD, Blaine Marie Sklar, DNP, AGACNP-BC, Mark Petrovic M.S, Whitney D. Gannon, MSN, MS, Cenea Kemp, MD, Anna-Maria Eid, MD, Anil J. Trindade, MD, Caitlin T. Demarest, MD, PhD, Frederick W Lombard, MD, Matthew Bacchetta, MD, MBA, Konrad Hoetzenecker, MD, PhD

### Introduction

Optimal anticoagulation during bilateral lung transplantation (BOLT<sub>x</sub>) supported with venoarterial extracorporeal membrane oxygenation (V-A ECMO) remains unclear. We compared outcomes among zero-heparin (ZH), low-intensity heparin (LIH), and high-intensity heparin (HIH) strategies during intraoperative V-A ECMO support for BOLT<sub>x</sub>.

### Methods

We conducted a retrospective pilot study of 59 consecutive patients who underwent BOLT<sub>x</sub> with intraoperative V-A ECMO at Vanderbilt University Medical Center between November 1, 2024, and May 1, 2025. Patients were stratified according to intraoperative anticoagulation strategy: ZH (no intraoperative anticoagulation; n=22), LIH (single bolus M2000 units without continuous infusion; n=16), and HIH (single bolus >2000 units followed by heparin infusion 200–500 units/hour; n=21). The primary outcome was thromboembolic events within 90 days after transplantation, including stroke, myocardial infarction, pulmonary embolism, deep venous thrombosis (DVT), arterial thrombosis, or intracardiac or anastomotic thrombosis. Secondary outcomes included estimated blood loss, transfusion requirements, ECMO circuit thrombosis, primary graft dysfunction (PGD) at 72 hours, hospital length of stay, and in-hospital mortality.

### Results

Among 59 patients, 33 (56%) experienced a thromboembolic event within 90 days. Events occurred in 16 patients (48.5%) in the HIH group, 9 (27.3%) in the LIH group, and 8 (24.2%) in the ZH group. Most events were catheter- or cannula-associated DVTs detected on routine surveillance imaging (HIH: 11/16 [68.8%]; LIH: 8/9 [88.9%]; ZH: 7/8 [87.5%]). One myocardial infarction requiring percutaneous coronary intervention occurred in both the HIH and ZH groups. One ischemic stroke occurred in the HIH and LIH groups, and one pulmonary embolism occurred in the LIH group. No ECMO circuit or oxygenator thrombosis was observed. Operative duration and red blood cell transfusion requirements were higher in the HIH group, while lung ischemic time, PGD, estimated blood loss, and other transfusion requirements were similar across groups.

### Conclusions

In this single-center cohort, intraoperative V-A ECMO without systemic anticoagulation during BOLT<sub>x</sub> was feasible and was not associated with an observed increase in early catastrophic thromboembolic events compared with low-intensity anticoagulation. Larger prospective studies are warranted.

## **Abstract # 52**

**Title:** Early Experience with Single-Port Transabdominal Colorectal Surgery: Implementation and Outcomes from the Largest Reported Cohort

**Authors:** Bradford James, Jessica K. Sims, Janavi Sethurathnam, Raha Almarzooqi, Aimal Khan

### **Background**

Single-port robotic systems represent the next evolution in minimally invasive colorectal surgery, with potential advantages in cosmesis, ergonomics, and recovery. While feasibility has been demonstrated in clinical trials, there is a lack of data on real life outcomes of this platform. This study describes the early implementation of a single-port robotic program for transabdominal and transanal colorectal surgery and reports outcomes from the largest single institution cohort to date.

### **Methods**

A database was maintained of all patients undergoing single-port colorectal surgery at a high-volume academic colorectal surgery practice. Data collected included patient demographics, operative characteristics (procedure type, operative time, conversion to multi-port/open), and postoperative outcomes (complications, length of stay, readmission, and anastomotic leak within 30 days). If applicable, pathologic variables were recorded for oncologic cases including T stage and number of lymph nodes harvested. Implementation outcomes, including feasibility (completion without conversion), and learning curve trends via operative and in-room time were assessed.

### **Results**

A total of 40 patients underwent single-port colorectal surgery during the study period, of which 32 were transabdominal, representing the largest cohort reported to date. The most common procedures included sigmoid colectomy, low anterior resection, right hemicolectomy, transabdominal vaginoplasty, and 8 cases of transanal minimally invasive surgery (TAMIS). Feasibility was high, with 0 conversions to open or multi-port approaches. For similar cases, both mean operative times and mean in-room times improved over time. Postoperative recovery was favorable, with a mean length of stay of 4.5 days, and 30-day readmission/complication rates consistent with traditional multiport robotic approaches. For oncologic cases, adequate lymph node harvest (>12) and R0 resection was achieved in all cases.

### **Conclusions**

Single-port transabdominal colorectal surgery can be safely and effectively implemented in an academic colorectal practice. Early results from the largest cohort to date demonstrate excellent short-term outcomes and oncologic adequacy, with evidence of efficiency gains over time. These findings support broader evaluation of single-port technology as a standard option for minimally invasive colorectal surgery.

## **Abstract # 53**

**Title:** Mycotic Brachial Artery Aneurysm Arising from Infected Revision of Arterial Inflow Graft

**Authors:** Emily Swafford, MD; Sanjana Borle, BS; Punit Vyas, MD; Grant Woodruff, DO; Ziad Al Adas, MD

### **Background:**

Mycotic aneurysms of the upper extremity are rare and are most commonly associated with intravenous drug use, bacteremia, or prosthetic material. Brachial artery involvement is particularly uncommon. Revision using distal inflow (RUDI) grafts are frequently employed for dialysis steal-related complications; however, infectious sequelae following graft ligation after renal transplantation is poorly described in the literature. We report a unique case of mycotic brachial artery aneurysm arising from an infected, occluded RUDI graft in an immunocompromised patient following renal transplantation.

### **Methods**

A 39-year-old male with a history of renal transplantation for end stage renal disease presented with a progressively enlarging right upper extremity mass. His vascular history was significant for prior right upper extremity brachiocephalic arteriovenous fistula with multiple prior revisions, including RUDI graft placement. Following successful renal transplantation and cessation of dialysis, the fistula was ultimately ligated. Preoperative imaging revealed a 5-cm brachial artery aneurysm and operative exploration was performed. Intraoperatively, a brachial artery aneurysm was encountered at the radial-ulnar bifurcation, associated with an occluded and infected RUDI graft containing purulent fluid. Complete excision of the aneurysm and infected graft was performed. Arterial reconstruction consisted of a brachial-to-ulnar artery bypass using reversed great saphenous vein with reimplantation of the radial artery.

### **Results**

Following excision and reconstruction, palpable radial and ulnar arteries were present. Intraoperative cultures grew oxacillin resistant *Staphylococcus epidermidis* and *Staphylococcus capitis*, and targeted antibiotic therapy was initiated. The patient's postoperative course was uncomplicated without evidence of ischemia or recurrent infection. Duplex ultrasound at one month demonstrated patent bypass graft with satisfactory flow.

### **Conclusions**

To our knowledge, this is the first reported case of a mycotic brachial artery aneurysm rising from an infected RUDI graft. It underscores the importance of maintaining a high index of suspicion for mycotic aneurysm formation in immunocompromised patients, particularly in the presence of retained or previously ligated prosthetic vascular material. Early recognition and definitive surgical management are essential to achieving durable and favorable outcomes.

## Abstract # 54

**Title:** Factors associated with axillary pathologic complete response to neoadjuvant chemotherapy in patients with axillary lymph-node positive breast cancer

**Authors:** Meredith A. Achey, MD; Run Fan, PhD, MS; Yu Shyr, PhD; Rachel L. McCaffrey, MD

### Introduction

Management of axillary lymph node disease in breast cancer continues to evolve. Identifying factors associated with pathologic complete response (PCR) in the axilla after neoadjuvant chemotherapy may help clarify which patients benefit from upfront chemotherapy.

### Methods

We retrospectively identified patients with clinical evidence of axillary metastases who underwent neoadjuvant chemotherapy between 2018-2023 using an institutional cancer registry. Patients with stage 4 disease were excluded. We grouped patients by tumor biology (Her2+/any HR; Her2-/HR+, and TNBC), created a binary variable for axillary response, and used a multivariable logistic regression model to identify factors associated with axillary PCR.

### Results

A total of 313 women were included; 130 (41.5%) had Her2-/HR+ disease, 94 (30%) had Her2+/any HR disease, and 89 (28%) had TNBC. The rate of PCR in the axilla was 16.2% in those with Her2-/HR+ disease, and 59.6% and 61.8% in Her2+/any HR and TNBC, respectively ( $p < 0.001$ , Pearson's Chi-square). Her2+ tumors with higher proliferative rate responded more favorably to neoadjuvant chemotherapy (intermediate proliferative rate aOR = 21.6; 95% CI: 3.4-135.8,  $p = 0.001$  and high proliferative rate aOR = 42.5; 95% CI: 4.9-368.5,  $p = 0.0007$ ). Her2+ tumors with higher grade had a marginally worse response (aOR = 0.23; 95% CI: 0.05-1.07;  $p = 0.06$ ).

### Conclusions

Axillary PCR with neoadjuvant chemotherapy is lower in patients with Her2-/HR+ breast cancer. In patients with Her2+ disease, higher proliferative rate is associated with improved axillary response. This study contributes to the growing body of axillary response literature which leads to a more tailored approach for patients.