

2026 RESEARCH SYMPOSIUM

31ST ANNUAL HELEN & JOHN SCHILLING LECTURE



GUEST SPEAKER

**SELWYN M.
VICKERS,
MD, FACS**

FRIDAY, MARCH 20TH, 2026
UW TOWER AUDITORIUM

FOREWARD

Welcome to the Department of Surgery’s 31st Schilling Research Symposium! The Helen and John Schilling Lecture and Research Symposium and the research it promotes has been nurtured by many in the Department of Surgery. Thank you for being a part of this great legacy year after year.

Over the course of three days, we spend time dedicated to the innovative research of our trainees. We begin with a presentation of e-poster “quick shot” presentations that test the limits of the research elevator pitch. A roundtable discussion showcases the work of our Department and provides time for an informal discussion with our visiting professor. Concluding the celebration of research is a full-day symposium with presentations from our trainees highlighted by a keynote lecture from our prominent Schilling Visiting Professor.

The Schilling Research Symposium is one of many ways the Department supports research. The Department of Surgery hosts the Division of Research, which was created in July 2023 with a vision to advance the research mission within the Department. We support faculty, fellows, residents, and staff – in finding greater satisfaction, support, and success in their academic pursuits. Since its inception, the Division has grown in size, focus, and impact. Last year, the Department also announced an investment of \$1.2 million in the research pursuits of its faculty members, with a focus on revitalizing our clinical research infrastructure. This investment recognizes the importance of research in our Department’s mission and a commitment to “walk the talk” at a time when science funding is particularly challenging. These funds have been supporting faculty who are developing clinical research projects, translational scientists purchasing equipment that will accelerate innovation, and surgeon-scientists pursuing training grants. These and an array of other activities make it easier for you to pursue research projects, at a time when thoughtful research pursuits are most needed.

Whether or not research is a part of your day-to-day work in the department, you are a key part of the culture of inquiry that makes our Department strong. We each contribute to that culture daily by asking and encouraging questions, inspiring students and residents to innovate, participating in clinical trials, applying for research fundings, and leading studies. Now more than ever, it is important to maintain this thriving culture of inquiry. Thank you for all you do to reinforce our tradition of research, and for celebrating research in the Department.



Douglas E. Wood, MD, FACS, FRCSED
The Henry N. Harkins Professor and Chair
Department of Surgery
University of Washington



David R. Flum, MD, MPH, FACS
Professor of Surgery, Adjunct Professor
School of Public Health and Pharmacy
Vice Chair for Research, Department of Surgery
Director, Surgical Outcomes Research Center (SORCE)

31ST ANNUAL HELEN & JOHN SCHILLING LECTURE GUEST SPEAKER SELWYN M. VICKERS, MD, FACS



Dr. Selwyn Vickers is President and CEO of Memorial Sloan Kettering Cancer Center (MSK) and Director of the MSK Comprehensive Cancer Center. He is a world-renowned surgeon, pancreatic cancer researcher, and pioneer in health disparities research. His major research interests include gene therapy as an application in the treatment of pancreatobiliary tumors, the role of growth factors and receptors in the oncogenesis of pancreatic cancer, the implications of FAS expression and Tamoxifen in the growth and treatment of cholangiocarcinoma, assessment of clinical outcomes in the surgical treatment of pancreatobiliary tumors, and the role of death receptors in the treatment of pancreatic cancer.

Dr. Vickers is a member of the National Academy of Medicine (NAM), Fellow of the American Association for Cancer Research and Honorary Member of the American Society for Clinical Investigation. He is a member of over 22 professional societies and has held leadership roles in many, including the NAM, American Surgical Association and Society of Black Academic Surgeons. He has more than 270 peer-reviewed publications spanning 25 years of NIH funding investigating the molecular basis for pancreatic adenocarcinoma, developing novel therapeutic approaches, and understanding disparities in cancer incidence, access to care, and clinical trial enrollment.

Dr. Vickers has held several academic leadership roles including Chair of the Department of Surgery at the University of Minnesota Medical School, Dean and Senior Vice President of the Heersink School of Medicine at University of Alabama at Birmingham (UAB) and CEO of the UAB Health Systems and CEO of the UAB/Ascension St. Vincent’s Alliance.



Meghan R.
Flanagan,
MD, MPH, FACS

Welcome to the 31st Annual Department of Surgery Research Symposium and Schilling Lecture. Today we gather to celebrate the scholarly achievements of our residents and fellows, the dedicated faculty mentors who guide their work, and the opportunity to learn from a distinguished leader in academic surgery. This symposium reflects the rigor, collaboration, and intellectual curiosity that define our research community—faculty, trainees, staff, and students—who share a commitment to advancing the science that shapes the future of surgical care.

As Director of Training and Engagement for the Division of Research, I am honored to help lead this year's Schilling Symposium. The breadth of this year's abstract submissions reflects the full scope of scholarly work within our Department. Research presented today spans basic and translational science, clinical outcomes, health services and cost research, equity-focused investigation, and systems-based studies. Submissions represent nearly every surgical division, including oncology, vascular surgery, pediatric surgery, plastic surgery, trauma and critical care, burns, emergency general surgery, and cardiothoracic surgery. This underscores the depth, diversity, and collaborative strength of our research community.

We are honored to welcome Dr. **Selwyn Vickers** as this year's Schilling Visiting Professor. Dr. Vickers is an internationally recognized surgeon-scientist and academic leader whose career has spanned scientific discovery, translational investigation, and health equity. His research has focused on gastrointestinal malignancies and the biological, clinical, and systemic factors that contribute to disparities in cancer outcomes. Through his work in tumor biology, outcomes research, and population health, Dr. Vickers has helped illuminate how cancer biology, access to care, and social determinants intersect to shape survival. His leadership in strengthening research infrastructure and advancing inclusive excellence in academic medicine has further expanded the impact of surgical research and broadened pathways for future generations of investigators.

It is also with great enthusiasm that we recognize Dr. **Eileen Bulger** as the recipient of this year's Schilling Distinguished Faculty Award. This award honors University of Washington surgeon-scientists whose careers exemplify sustained scientific contribution, mentorship, and leadership. Dr. Bulger is a nationally respected leader in trauma and critical care research, with a program of work centered on improving outcomes after injury through clinical trials, resuscitation science, and systems-based trauma care. Her research has

advanced the understanding of hemorrhage control, early resuscitation strategies, and the optimization of trauma systems to deliver timely, evidence-based care. In parallel with her scientific accomplishments, Dr. Bulger has been a dedicated mentor and collaborative leader, shaping multicenter research efforts and training generations of clinician-investigators committed to improving care for injured patients.

The Surgery Research Symposium and Schilling Lecture are made possible through the generosity of the late Helen Schilling in honor of her husband, Dr. John Schilling. The Schillings' deep commitment to teaching, scholarship, and research continues to shape this event and its mission. By providing a platform for residents and fellows to present their work, supported by dedicated faculty mentorship, we carry forward their legacy of advancing surgical science and education. This symposium also offers an important educational experience, allowing trainees to refine their scientific communication skills through formal presentations, discussion, and constructive feedback.

The Schilling Research Day is a celebration of our shared commitment to research and its essential role in improving the care we provide every day. Every member of the Department contributes to this mission. Each of you is involved in this through identification of meaningful clinical questions, mentoring learners, engaging patients in trials, securing funding, translating evidence into practice or sharing discoveries through scholarship. Research remains a cornerstone of academic surgery, fueling innovation and shaping the future of patient care. We thank you for your dedication to this work and for ensuring that research continues to thrive at the University of Washington.

A stylized, handwritten signature in dark ink, likely belonging to Meghan R. Flanagan.

Meghan R. Flanagan, MD, MPH, FACS
Director of Training and Engagement
Division of Research
Associate Professor
Division of General Surgery



Helen & John Schilling

The Helen and John Schilling Endowed Lectureship was established by the late Helen Schilling to bring distinguished scholars to the Department of Surgery at the University of Washington, and to enhance the department’s commitment to the highest standards of patient care, teaching, research and scholarship. It was Mrs. Schilling’s wish that the lectureship be named in honor of her husband, John.

Dr. Schilling devoted his life to academic medicine in a career spanning 50 years. He was born and raised just outside Kansas City, Missouri, and at the age of 15 entered Dartmouth College. After graduating from Dartmouth in 1937, he attended Harvard Medical School as a member of the class of 1941, the last class to graduate before World War II. In the six months before the start of his internship and residency at Roosevelt Hospital in New York City, he signed on as a ship’s doctor on the schooner Effie M. Morrissey for a scientific expedition to the Arctic sponsored by the U.S. Bureau of Standards.

After a number of perilous adventures along the Greenland coast and in the Hudson Straits, he returned to New York and started his training in general surgery. He joined the surgical staff at the University of Rochester in 1945 where he began his lifelong work on wound healing. His career at Rochester was interrupted for several months by a stint in the Central Pacific (Eniwetok) to participate in the study of flash burns as part of the atom bomb tests and the Manhattan Project. Subsequently he joined the Air Force as a volunteer and set up a surgical department at the new School of Aviation Medicine in San Antonio.

In 1956 Dr. Schilling was invited to be the Chief of the first full-time Department of Surgery in the new medical school at the University of Oklahoma. He was successful in recruiting a number of outstanding junior faculty, many of whom went on to become chairs. In addition to his administrative responsibilities, he maintained an extensive research program in wound healing in collaboration with Dr. Betty White. At the end of 18 years, Dr. Schilling and his faculty had trained 75 surgeons from Oklahoma and adjoining states, and had established a department known for its academic accomplishments.

Dr. Schilling came to the University of Washington in 1974 as a senior investigator and, upon the sudden resignation of the chair, was asked to take over the management of the Department of Surgery. Thus began his third chairmanship which lasted eight years until his retirement. His first responsibility was to recruit faculty to fill the many vacancies, a task he achieved after several stormy years. Upon his retirement in 1983, he had recruited 41 new faculty members and graduated a total of 40 chief residents.

His career in academic surgery was marked by a devotion to patient care and teaching, as well as research. Despite his commitment to the profession, Dr. Schilling still found time to engage in other activities. From his early childhood he enjoyed the outdoors and had become an expert tennis player, skier, and fly fisherman; he always believed that one’s life work should be punctuated by intervals of travel and recreation.

Helen Schilling shared with her husband both the non-academic as well as the academic side of his life. They first worked together in Rochester and continued their professional association through the years in Oklahoma and Washington. They were married in 1979. Mrs. Schilling had a career in newspaper work and administration after graduating from Oberlin College. This dual background enabled her to be his close associate and administrative assistant for 40 years.

7:15AM WELCOME—DOUGLAS E. WOOD, MD, FACS, FRCS(ED), THE HENRY N. HARKINS PROFESSOR AND CHAIR

7:20AM INTRODUCTION—MEGHAN R. FLANAGAN, MD, MPH, FACS, ASSOCIATE PROFESSOR, DIVISION OF GENERAL SURGERY

– SESSION 1 –

MODERATOR 1: ERIKA BISGAARD, MD, ASSISTANT PROFESSOR, DIVISION OF TRAUMA, BURN & CRITICAL CARE SURGERY

MODERATOR 2: JEREMY SHARIB, MD, ASSISTANT PROFESSOR, DIVISION OF GENERAL SURGERY

TIME	EVENT	PRESENTER	PRESENTATION TITLE	PAGE
7:30am		JAMIE OLAPO, MD <i>Postdoctoral Research Fellow</i>	<i>“PROPHYLACTIC INSULIN TO IMPROVE OUTCOMES IN SURGICAL PATIENTS WITHOUT DIABETES: A PILOT RANDOMIZED, CONTROLLED TRIAL X”</i>	10
7:45am		ARJUNE DHANEKULA, MD <i>Cardiothoracic Surgery R5</i>	<i>“USE OF A 3D-ENGINEERED TISSUE MODEL TO ASSESS AGE-RELATED DIFFERENCES IN AORTIC SMOOTH MUSCLE CELL FUNCTION”</i>	11
8:00am		PAUL MCCLURE, MD <i>Pediatric Research Fellow</i>	<i>“PRELIMINARY DESCRIPTION OF PRE- AND POST-OPERATIVE CARE FOR PRIMARY ANORECTAL MALFORMATION REPAIR FOR PATIENTS IN THE PCPLC”</i>	12
8:15am		ANNA INTARA, MD <i>General Surgery R2</i>	<i>“PANCREATICODUODENECTOMY WITH VENOUS RESECTION USING INTRAOPERATIVE ULTRASOUND GUIDANCE: AN IMPORTANT COMPONENT OF COMPLEX PANCREATIC SURGERY”</i>	13
8:30am		KARISSA WANG, MD <i>Vascular Surgery R2</i>	<i>“RESULTS OF DEDICATED VENOUS STENTS IN TREATING CHRONIC INFERIOR VENA CAVA OCCLUSIONS”</i>	14
8:45am		CODY MCHARGUE, MD <i>Surgical Critical Care Fellow</i>	<i>“REENVISIONING BURN SEVERITY ASSESSMENT: THE COMPUTER VISION-ENABLED BAYESIAN “UDJAT SCORE” OUTPERFORMS CONVENTIONAL BURN SEVERITY MEASURES”</i>	15
9:00am	MATCH DAY ANNOUNCEMENT	DOUGLAS E. WOOD, MD, FACS, FRCS(ED), THE HENRY N. HARKINS PROFESSOR AND CHAIR		
9:15am	BREAK			

– SESSION II –

MODERATOR 1: KATIE LIU, MD, PHD, ASSISTANT PROFESSOR, DIVISION OF PLASTIC SURGERY

MODERATOR 2: JAKE HEMINGWAY, MD, ASSISTANT PROFESSOR, DIVISION OF VASCULAR SURGERY

9:30am		JASON CARTER, MD, PHD <i>Research Resident</i>	<i>“SINGLE-CELL AND SPATIALLY RESOLVED MULTI-OMICS IDENTIFY CLINICALLY TARGETABLE IMMUNOSUPPRESSIVE NICHE IN FIBROBLASTIC CARCINOMA”</i>	16
9:45am		MARCELO URIARTE, MD <i>Craniofacial Surgery Fellow</i>	<i>“NASAL TIP SUPPORT MECHANISMS IN PRIMARY CLEFT RHINOPLASTY: A SYSTEMATIC REVIEW”</i>	17
10:00am		GRACE KENNEDY, MD <i>Postdoctoral Research Fellow</i>	<i>“HOW IMMUNOCOMPROMISED ARE THEY? SEVERITY RANKING IMMUNOCOMPROMISE CONDITIONS IN EMERGENCY GENERAL SURGERY”</i>	18
10:15am		KATE MCNEVIN, MD <i>Pediatric Research Fellow</i>	<i>“ONE-YEAR OUTCOMES FOR PATIENTS UNDERGOING ANTEGRADE CONTINENCE ENEMA (ACE) PROCEDURES WITHOUT PRIOR RECTAL ENEMA THERAPY: A PCPLC STUDY”</i>	19
10:30am		NICOLAS STAFFORINI, MD <i>Vascular Surgery Chief Resident</i>	<i>“MODERN MANAGEMENT AND OUTCOMES OF PENETRATING UPPER EXTREMITY ARTERIAL INJURIES AT A LEVEL I TRAUMA CENTER”</i>	20
10:45am		ALEXANDRA HERNANDEZ, MD, MCR <i>General Surgery R4</i>	<i>“LANGUAGE BARRIERS IMPACT PREHOSPITAL INTUBATION AFTER TRAUMA”</i>	21
11:00am		ISRA ABDULWADOOD, MD <i>Plastic Surgery R1</i>	<i>“NAVIGATING HEMODYNAMIC RISK FOLLOWING DEEP INFERIOR EPIGASTRIC ARTERY PERFORATOR FLAPS IN THE BLOOD PRODUCT DECLINING PATIENT”</i>	22
11:15am	SCHILLING DISTINGUISHED FACULTY AWARDEE - EILEEN BULGER, MD, MPH, PROFESSOR & CHIEF OF TRAUMA, BURN & CRITICAL CARE SURGERY, SURGEON-IN-CHIEF INTRODUCED BY SAM ARBABI, MD, MPH, FACS, PROFESSOR & CHIEF OF TRAUMA			
11:30am	BREAK			

– SESSION III –

MODERATOR 1: CHRISTINA GREENE, MD, ASSISTANT PROFESSOR, DIVISION OF CARDIOTHORACIC SURGERY

MODERATOR 2: KEVIN LABADIE, MD, ASSISTANT PROFESSOR, VA PUGET SOUND HEALTH CARE SYSTEM

11:45am		KRISTIN GOODSSELL, MD <i>Research Resident</i>	<i>“RESISTANCE TO IMMUNOTHERAPY IN COLORECTAL LIVER CANCER METASTASES: ARE SPP1+ MACROPHAGES INNOCENT BYSTANDERS OR CRIMINAL MASTERMINDS”</i>	23
12:00pm		BLAKE MURPHY, MD <i>Research Resident</i>	<i>“IN-HOSPITAL VASCULAR SURGERY CONSULTATION IS ASSOCIATED WITH IMPROVED FOLLOW-UP AND EARLIER IDENTIFICATION OF ANEURYSMAL DEGENERATION AFTER ACUTE TYPE A AORTIC DISSECTION”</i>	24
12:15pm		ERICA JOHNSON, MD <i>Research Fellow</i>	<i>“MEASURING CLINICIANS’S EQUITY FOCUSED BEHAVIORS”</i>	25
12:30pm		JOSHUA MOSTALES, MD <i>Research Resident</i>	<i>“IMPACT OF NEOADJUVANT TREATMENT LOCATION ON PATIENT OUTCOMES IN A REGIONAL PANCREAS CANCER MULTIDISCIPLINARY CLINIC”</i>	26
12:45pm		SARAH RUDASILL, MD <i>Postdoctoral Research Fellow</i>	<i>“PREDICTING NODAL DISEASE AMONG PATIENTS WITH LUNG CANCER”</i>	27
1:00pm		GRIFFEN ALLEN, MD, MBE <i>Postdoctoral Research Fellow</i>	<i>“IS THE USE OF ANTIBIOTICS FOR THE TREATMENT OF APPENDICITIS REALLY COST SAVING? A COST ANALYSIS OF THE COMPARISON OF OUTCOMES OF ANTIBIOTIC DRUGS AND APPENDECTOMY (CODA) TRIAL”</i>	28
1:15pm	LUNCH			
2:15pm	31ST ANNUAL SCHILLING LECTURE	“PREPARE FOR YOUR NEXT OPPORTUNITY: A SURGICAL LEADER’S PERSPECTIVE ON A CAREER IN ACADEMIC SURGERY”		
	GUEST LECTURER – SELWYN M. VICKERS, MD, FACS			
3:15pm	ANNOUNCE WINNERS/CLOSING	DAVID R. FLUM, MD, MPH, FACS, PROFESSOR OF SURGERY, VICE CHAIR FOR RESEARCH, DIVISION OF RESEARCH MEGHAN R. FLANAGAN, MD, MPH, FACS, ASSOCIATE PROFESSOR, DIVISION OF GENERAL SURGERY		

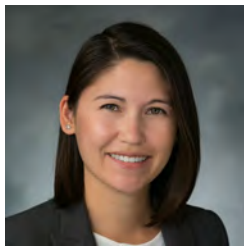
Moderators

Erika Bisgaard, MD – Assistant Professor, Division Trauma, Burn & Critical Care Surgery



Dr. Erika Bisgaard is a trauma surgeon and intensivist. She is an attending surgeon at Harborview with a practice that spans trauma, acute care surgery, intensive care and management of ECMO. Her research interests include trauma education, resident education and wellness, and surgical infection. She completed her medical school at Louisiana State University in New Orleans and went on to complete her general surgery residency training at the University of Texas Southwestern. She came to Harborview where she completed her trauma and surgical critical care fellowship after which she stayed on as an Assistant Professor of Surgery and has become one of the associate program directors for the general surgery residency program.

Christina Greene, MD – Assistant Professor, Division of Cardiothoracic Surgery



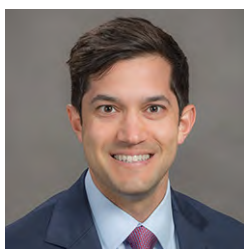
Dr. Greene is a Congenital Heart Surgeon at Seattle Children’s Hospital and Assistant Professor of Surgery at UW. She completed her undergraduate studies at MIT then returned home to USC in Los Angeles for medical school where she stayed for general surgery residency before transitioning to the I6 Program at Stanford for her adult cardiac training. She completed her congenital fellowship at Boston Children’s Hospital before starting her first job here in Seattle in the fall of 2021. She is a Principal Investigator at the Seattle Children’s Research Institute where her translational lab investigates the genetic causes of congenital heart disease and is an Adjunct Assistant Professor of Mechanical Engineering where she is studying RBC shear and trying to optimize cardiopulmonary bypass. Dr. Greene treats the full spectrum of congenital heart disease but has special interest in complex neonatal and biventricular repair.

Jake Hemingway, MD – Assistant Professor, Division of Vascular Surgery



Dr. Hemingway is a vascular surgeon practicing at Northwest Hospital. His clinical and research interests include acute aortic emergencies, vascular trauma, peripheral arterial disease, vascular malformations, and complex venous disease, including pelvic venous disorders and deep venous stenting.

Kevin Labadie, MD – Assistant Professor, VA Puget Sound Health Care System



Dr. Labadie is surgical oncologist whose practice is primarily based at the VA Puget Sound. He completed his general surgery residency and research fellowship at the University of Washington, followed by a fellowship in Complex General Surgical Oncology at the City of Hope Cancer Center. His clinical practice focuses on the care of patients with hepatobiliary and pancreatic malignancies. He is developing a research program to enhance the peri-operative treatment of patients with gastrointestinal cancers and has authored more than 35 peer-reviewed publications and several book chapters. Dr. Labadie is dedicated to medical/surgical education and has produced multi-media educational materials for the USMLE and American Board of Surgery In-Training Exams. In his free time, Dr. Labadie enjoys skiing and mountain biking with his wife.

Jeremy Sharib, MD – Assistant Professor, Division of General Surgery



Dr. Sharib is an Assistant Professor of surgery in the section of complex abdominal oncology. His clinical interests include treatment of patients with sarcoma and peritoneal malignancies. Jeremy’s is a member of the UW Tumor Immune Microenvironment (TIME) lab, where he has funded research investigating the influence of the immune system on the development of peritoneal metastases. Prior to joining UW, Dr. Sharib completed complex general surgical oncology fellowship at Duke University and general surgery residency at UCSF. Jeremy is dedicated to running, biking, hockey, and staying fit.

RESEARCH LEADERSHIP



**DOUGLAS E. WOOD,
MD, FACS, FRCSED**
The Henry N. Harkins
Professor and Chair



**DAVID R. FLUM,
MD, MPH, FACS**
Professor of Surgery
Vice Chair
for Research,
Division of Research



**SAMAN
ARBABI
MD, MPH,
FACS**
Professor &
Chief of Trauma



**AUSTIN
BAIRD, PHD**
Research
Assistant
Professor



**SCOTT
BRAKENRIDGE,
MD, FACS**
Professor



**AARON
CHENG,
MD, FACS**
Associate
Professor



**CHRISTOPHER
CROWE, MD**
Assistant
Professor



**GIANA
DAVIDSON,
MD, MPH,
FACS**
Professor



**MEGHAN
FLANAGAN,
MD, MPH,
FACS**
Associate
Professor



**MARIAM
HANTOULI,
MD**
Research
Assistant
Professor



**CATHERINE
KLING,
MD, MPH**
Professor



**RON
MAIER,
MD, FACS**
Professor



**HARVESH
MOGAL,
MD, MS,
FACS, DABS,
FSSO**
Professor



**GRANT
O'KEEFE,
MD, MPH**
Professor



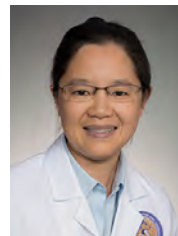
**DAVID
ROTHSTEIN,
MD, MS**
Professor



**JOHN SCOTT,
MD, MPH**
Associate
Professor



**JEREMY
SHARIB, MD**
Assistant
Professor



**GALE
TANG, MD,
FACS, RPVI**
Professor



**PETER
WU, MD,
FACS**
Professor



**SARA
ZETTERVALL,
MD, MPH**
Assistant
Professor



Eileen Metzger Bulger, MD, FACS, is Professor of Surgery at the University of Washington and currently serves as Surgeon-in-Chief at Harborview Medical Center and Chief of the Division of Trauma, Burn, and Critical Care. A nationally and internationally recognized trauma surgeon-scientist,

Dr. Bulger has devoted her career to advancing the science of trauma resuscitation, prehospital care, critical care, and systems-based approaches to injury prevention and recovery.

Dr. Bulger earned her B.A. from The Johns Hopkins University and her M.D. from Cornell University Medical College. She completed her General Surgery residency at the University of Washington, followed by an NIH-funded Trauma Research Fellowship and a fellowship in Surgical Critical Care. She joined the faculty at the University of Washington in 2000 and was promoted to Professor in 2009.

From early in her career, Dr. Bulger demonstrated a deep commitment to rigorous translational investigation. Her NIH-funded laboratory research helped define mechanisms of inflammation and immune modulation following injury, including the role of hypertonic resuscitation and macrophage activation pathways. She subsequently translated these insights into large, multicenter clinical trials that reshaped trauma practice. As a leader in the Resuscitation Outcomes Consortium and numerous NIH and Department of Defense funded investigations, she served as principal investigator, co-principal investigator, or site PI on landmark trials evaluating hypertonic resuscitation, prehospital airway management, tranexamic acid use, massive transfusion strategies, and trauma system outcomes.

Her scholarship includes more than 340 peer reviewed publications spanning basic science, clinical trials, trauma systems research, and injury epidemiology. Her work has helped define national standards for prehospital triage, field trauma guidelines, hemorrhage control, and trauma system performance. In parallel, she has led major national efforts to coordinate trauma research, including serving as Chair of the Board of the Coalition for National Trauma Research and co-leading development of a National Trauma Research Action Plan funded by the Department of Defense.

Dr. Bulger's influence extends well beyond individual studies. She has held numerous national leadership roles, including President of the American Association for the Surgery of Trauma and Chair of the American College of Surgeons Committee on Trauma. In these roles, she guided the development of evidence based guidelines, trauma verification standards, prehospital hemorrhage control recommendations, and national initiatives focused on firearm injury prevention and trauma informed care. Her leadership has been characterized by a steadfast commitment to multidisciplinary collaboration, equity in trauma care, and translation of science into measurable improvements in patient outcomes.

At Harborview Medical Center, Dr. Bulger has served as Chief of Trauma, Medical Director of the ECLS program, Associate Medical Director of Surgical Services, President of the Medical Staff, and now Surgeon-in-Chief. Under her leadership, Harborview has strengthened its position as a national leader in trauma, burn, and critical care innovation while expanding programs in violence intervention, trauma survivorship, and community based injury prevention.

Equally important has been her dedication to mentorship. Dr. Bulger has trained and mentored generations of residents, fellows, and junior faculty, many of whom have become leaders in trauma surgery and surgeon-scientists in their own right. She has consistently championed opportunities for women and underrepresented minorities in surgery, founding and supporting initiatives such as Women in Trauma Surgery and national mentorship programs within trauma research collaboratives.

Throughout her career, Dr. Bulger has embodied the principles of the surgeon-scientist: asking clinically meaningful questions, designing rigorous investigations, building collaborative networks, and ensuring that discoveries translate into improved care for injured patients. Her work has influenced trauma systems across the United States and internationally, improved survival after severe injury, and strengthened the scientific foundation of acute care surgery.

For her sustained and transformative contributions to trauma research, surgical science, national policy, and mentorship, the University of Washington recognizes Dr. Eileen Metzger Bulger with the Surgeon-Scientist Career Achievement Award.

As one of her colleagues and friends for the past 34 years, I can say without hesitation that I cannot imagine anyone more deserving of this honor. Her integrity, intellect, leadership, and unwavering commitment to patients and to science make her an extraordinary surgeon-scientist and an even more extraordinary human being.



Dr. Bulger with friends and mentees at the American Association for the Surgery of Trauma (AAST) dinner in September 2025.

2026 RESEARCH SYMPOSIUM





JAMIE OLAPO, MD

Postdoctoral Research Fellow

RESEARCH INTERESTS: Lifestyle and diet to prevent and improve outcomes of common general surgery pathology

FACULTY MENTOR: Dave Flum, MD, MPH, FACS

MEDICAL SCHOOL: Medical College of Wisconsin

HOMETOWN: Oconomowoc, WI

DISCUSSANT: Giana Davidson, MD, MPH, FACS

PROPHYLACTIC INSULIN TO IMPROVE OUTCOMES IN SURGICAL PATIENTS WITHOUT DIABETES: A PILOT RANDOMIZED, CONTROLLED TRIAL

Schnuck Olapo J, Schmicker RH, Comstock BA, Knouff IA, DePaoli S, Fannon EE, Hirsch IB, Dellinger EP, Flum ER, Jones IA

BACKGROUND: Hyperglycemia during surgery occurs in 1 in 3 patients and significantly increases the risk of morbidity and mortality. While there has been a focus on glycemic control in patients with diabetes, the risk of complications related to hyperglycemia is actually greater for patients without diabetes (NoDM). We performed a pilot trial to confirm the safety and feasibility of administering prophylactic insulin to surgical patients with glucose and potassium (GIK) to prevent hyperglycemia.

METHODS: A randomized, placebo-controlled trial of GIK was conducted among NoDM patients undergoing elective, abdominopelvic surgery >3 hours. Endpoints included willingness to randomize, tolerability of the treatment and safety. Other outcomes included blood glucose (BG) measures, use of therapeutic insulin, neutrophil-lymphocyte ratio (NLR), and NSQIP adverse events through postoperative day 30.

RESULTS: 355 patients were approached and 103 (29%) agreed to participate (56% female, median age 58 yrs). Participants were randomized to GIK (n=50) or placebo (n=53). The treatment was completed in 97% and there were no serious adverse events. There were no episodes of critical hypoglycemia (BG<54 mg/dL). Euglycemia (<125 mg/dL) was more common in the GIK arm (42%), vs 28% control (p<.005). Intraoperative hyperglycemia (BG >140 mg/dL) was less common in the GIK (37%) vs controls (49%). The use of insulin to treat hyperglycemia was less common in the GIK arm (26% vs 45%, aRR 0.5 [95% CI 0.3, 1.1]). The change in NLR from baseline to POD1 was lower in the GIK group vs placebo. The proportion of patients experiencing a NSQIP AE within 30 days in the GIK group (12 vs 21%) was lower (aRR 0.5 [95% CI 0.2, 1.5]) than the control group.

CONCLUSION: An RCT of prophylactic insulin in surgical patients is feasible and safe. This pilot-RCT found signal that GIK prevents stress hyperglycemia and reduces complications, perhaps mediated through reduced inflammation.

RESEARCH INTERESTS: Aging biology, aortic biology, aortic surgical outcomes.

FACULTY MENTOR: David Marcinek, PhD, DLMP

MEDICAL SCHOOL: Wayne State

HOMETOWN: Detroit, MI

DISCUSSANT: Jay Pal, MD, PhD



USE OF A 3D-ENGINEERED TISSUE MODEL TO ASSESS AGE-RELATED DIFFERENCES IN AORTIC SMOOTH MUSCLE CELL FUNCTION

DhaneKula AS, Chetanwala S, Mattson-Hughes A, Burke CR, DeRoo SC, Hwang B, Pal JD, Mulligan MS, Marcinek DJ

BACKGROUND: Aging results in heightened stiffness and weakness in the thoracic aorta, increasing risk for both aortic disease and other cardiovascular diseases. Aortic smooth muscle cells (SMCs) play a central role in aortic pathology, but specific age-related changes that contribute to this process remain unclear. Here, we developed a novel 3D-engineered smooth muscle aortic tissue model (ESMAT) to identify how age affects both smooth muscle cell function and interaction with the surrounding extracellular matrix.

METHODS: Aortas from young (<50 years) and aged (>63 years) patients undergoing heart surgery were obtained. Both pathologic and non-pathologic aortas in each age group were included. Aortic SMCs were then isolated and grown to confluence in cell culture. These SMCs were subsequently casted in a collagen matrix between two posts under constant tension and assessed for changes in contraction over time.

RESULTS: This novel engineered tissue platform shows both feasibility with likely relevant biomechanical data. Early data from six patient samples grown in the ESMAT platform suggest that cells casted in the collagen matrix increase contraction over a one week assessment period. Current data are underpowered to for statistical comparison, but trends towards differences in age and disease state are noted in the data.

CONCLUSIONS: The ESMAT platform is a new and powerful tool for assessing aortic SMC biology in a physiologically-relevant context. This model has been shown to work, and suggests biomechanical differences in SMCs from patients with different ages and aortic disease states. Ongoing study will recruit more patient samples to appropriately power statistical analysis.

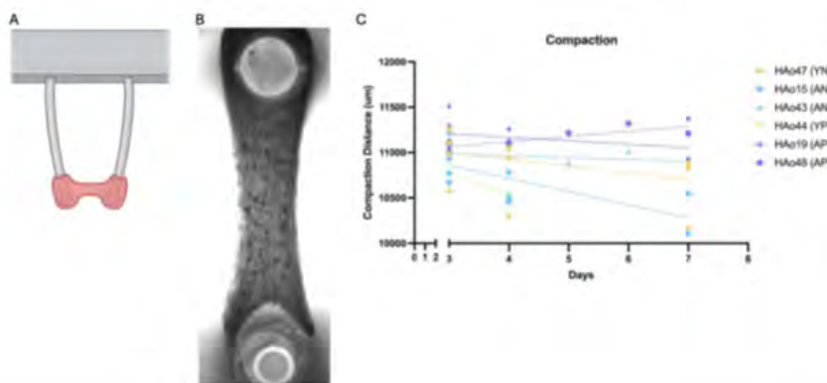
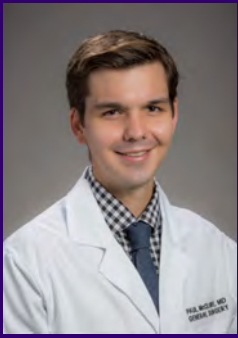


Figure 1: (A) Schematic representation of the ESMAT model, with the collagen/cell matrix grown in between two posts. (B) Actual picture of the ESMAT platform; the dark dots represent cells in the matrix. (C) Plot of average distance between the posts over time for the six patient samples, along with fitted lines. Overall, distance decreased over time, showing a general increase in force in each tissue sample. Comparisons between age/disease groups are yet to be performed, but this data suggests some differences may exist. YN – young, non-diseased SMCs; AN – aged, non-diseased; YP – young pathologic SMCs; AP – aged pathologic.



PAUL MCCLURE, MD

Pediatric Research Fellow

RESEARCH INTERESTS: Pediatric surgery, surgical outcomes, patient reported outcome measures, rural surgery

FACULTY MENTOR: Caitlin Smith, MD

MEDICAL SCHOOL: University of Minnesota

HOMETOWN: Minneapolis, MN

DISCUSSANT: Patrick Javid, MD

PRELIMINARY DESCRIPTION OF PRE- AND POST-OPERATIVE CARE FOR PRIMARY ANORECTAL MALFORMATION REPAIR FOR PATIENTS IN THE PCPLC

McClure P MD, McNevin K MD, Avansino J MD, Rice-Townsend S MD, Austin K Austin MD, Badillo A MD, Calliston JL MD, Calkins CM MD, Crady RC MS, Durham MM MD, Gayer C MD, PhD, Harris JC MD, Kawaguchi AL MD, Rana A MD, Reeder RW PhD, Rollins MD MD, Rosen N MD, Smith C MD

PURPOSE: Perioperative care for primary repair of anorectal malformations (ARM) varies widely, even among specialty centers, with limited evidence on optimal preoperative bowel preparation and timing of postoperative feeding. This study aims to describe current practices in the PCPLC related to preoperative bowel preparation and postoperative feeding, and evaluate complication rates associated with these variances.

METHODS: This prospective observational study included patients undergoing primary ARM repair without a diverting ostomy. No changes to site or provider practices were made; patients were followed prospectively from surgery date. Patients were excluded if the ARM repair was a reoperation, if they had previously undergone diversion, or underwent diversion in coordination with ARM repair. Data collected included demographics, ARM type, postoperative complications, and length of stay.

RESULTS: Between June 2025 to September 2025, 38 patients were enrolled; fifteen were excluded due to presence of ostomy. Most patients underwent posterior sagittal anorectoplasty (81.6%), median age at time of procedure was 4.0 months [2.0, 7.0]. Median hospital stay was 4 days. Most patients (65%) received no preoperative bowel preparation, and most (60.5%) were fed on POD ≤ 1 . Median length of stay was 2 days for patients fed on POD vs 18 days for patients kept NPO days. No complications were observed in the group that was fed early. Overall complications were low.

CONCLUSION: In this preliminary cohort, most patients undergoing primary ARM repair without ostomy received no preoperative bowel preparation and were fed early (POD ≤ 1). Early feeding was associated with shorter hospital stays without apparent increased complications. Overall complication rates were low, with all intra-operative (n=1) and 30-day complications (n=2) occurring in the no bowel prep group. Data collection and analysis are ongoing.

RESEARCH INTERESTS: Surgical oncology and HPB surgery outcomes, quality improvement, cancer immunology

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MEDICAL SCHOOL: Columbia University Vagelos College of Physicians and Surgeons

HOMETOWN: Kaneohe, HI

DISCUSSANT: Jonathan Sham, MD, MBEE



PANCREATICODUODENECTOMY WITH VENOUS RESECTION USING INTRAOPERATIVE ULTRASOUND GUIDANCE: AN IMPORTANT COMPONENT OF COMPLEX PANCREATIC SURGERY

Intara AS, Gao XY, Childers CP, Pillarisetty VG

BACKGROUND: Pancreaticoduodenectomy with venous resection (PD+VR) is increasingly performed in the era of neo-adjuvant therapy for locally advanced and borderline-resectable pancreatic cancer with venous involvement. PD+VR remains technically challenging and is associated with high postoperative morbidity, particularly related to bleeding. Despite its potential to guide dissection around complex venous anatomy, intraoperative ultrasound (IOUS) is rarely used in pancreatic surgery, but has become a cornerstone of pancreatic surgery at the University of Washington (UW).

METHODS: We retrospectively reviewed PD+VR cases performed with IOUS guidance by a single surgeon at UW from 2019 to 2025. Outcomes were compared with PD+VR cases without IOUS from ACS NSQIP, with supplemental case information from the ACS NSQIP Targeted Pancreatectomy database, from 2019 to 2023. PD cases without VR and NSQIP PD+VR cases with and without IOUS were analyzed separately. Outcomes included length of stay, perioperative blood transfusion, postoperative hemorrhage, 30-day readmission, reoperation, and mortality. Statistical analyses included chi-squared, Fisher's exact, and Mann-Whitney U tests.

Table 1: Key demographics, perioperative characteristics, and outcomes between PD+VR cohorts with and without IOUS and between PD+non-VR cohorts

	UW PD+VR (n=81)	ACS-NSQIP PD+VR, no IOUS (n=2662)	p-value	UW PD+non-VR (n=116)	ACS-NSQIP PD+non-VR (n=9678)	p-value
Demographics						
Age	67 (59-72)	67 (59-73)	0.47	68 (61-72)	67 (59-74)	0.93
Male Sex	53.1% (43)	53.4% (1421)	0.99	56% (65)	54.6% (5282)	0.82
Neoadjuvant Chemotherapy	67.9% (55)	48.2% (1274)	0.001	29.3% (34)	27.3% (2633)	0.71
Perioperative Characteristics						
Blood Transfusion within First 72 Hours Postop	7.4% (6)	26.4% (655)	<0.001	1.7% (2)	12.6% (1174)	<0.001
Estimated Blood Loss (mL)	150 (75-250)	Not collected	--	75 (50-150)	Not collected	--
Operative Time (min)	499 (413-576)	439 (343-542)	<0.001	376 (341-43)	369 (297-452)	0.11
Vein Involved						
Portal Vein	35.9% (28)	Not collected	--	N/A	N/A	--
Splenic Vein	7.7% (12)	Not collected	--	N/A	N/A	--
Superior Mesenteric Vein	69.2% (54)	Not collected	--	N/A	N/A	--
Other (IVC, IMV, 1 st jejunal)	15.4% (6)	Not collected	--	N/A	N/A	--
Type of Repair				N/A	N/A	--
Primary/Venorrhaphy	92.3% (72)	Not collected	--	N/A	N/A	--
End to End	7.6% (6)	Not collected	--	N/A	N/A	--
Graft/patch	2.6% (2)	Not collected	--	N/A	N/A	--
Outcomes						
30-day Mortality	0% (0)	2.1% (55)	0.41	0% (0)	2% (189)	0.18
Pancreatic Fistula	3.7% (3)	8.5% (225)	0.15	7.8% (9)	16.3% (1575)	0.01
Delayed Gastric Emptying	7.4% (6)	16.7% (445)	0.02	6% (7)	17.2% (1668)	<0.001
Percutaneous Drainage	4.9% (4)	15.2% (404)	0.01	10.3% (12)	14.8% (1435)	0.23
Post-operative Hemorrhage	2.5% (2)	11.7% (153)	0.01	0% (0)	7.5% (373)	0.002
Length of Stay	4 (4-5)	7 (6-11)	<0.001	4 (4-5)	7 (6-11)	<0.001
30-Day Re-operation	1.2% (1)	6.0% (160)	0.09	0% (0)	4.9% (470)	0.007
30-Day Readmission	8.6% (7)	16.4% (433)	0.07	15.5% (18)	18.2% (1761)	0.54

For binary variables, rates are reported as percent (n).

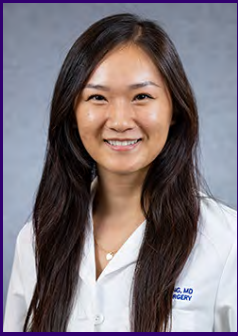
For continuous variables, outcome is reported as median (IQR).

Vein involvement percentages add up to over 100% due to incidents of multiple vein involvement.

Type of repair percentages add up to over 100% due to incidents of multiple types of repairs in one case.

RESULTS: We identified a total of 81 PD+VR cases using IOUS by a single surgeon at UW, compared with 2,662 ACS NSQIP PD+VR non-IOUS cases. UW PD+VR cases demonstrated significantly better outcomes than NSQIP cases: median length of stay - 4 days (IQR 4–5) versus 7 days (6–11) ($p<0.001$); transfusion rates within 72 hours postop - 7.4% versus 26.4% ($p<0.001$); and postoperative hemorrhage - 2.5% versus 11.7% ($p=0.01$). Rates of 30-day readmission (8.6% vs 16.4%, $p=0.07$), reoperation (1.2% vs 6%, $p=0.09$), and mortality (0% vs 2.1%, $p=0.41$) were not significantly different.

CONCLUSIONS: IOUS guidance during PD+VR is a critical component of safe, precise dissection associated with shorter hospital stays and reduced perioperative complications in complex pancreatic surgery.



KARISSA WANG, MD

Vascular Surgery R2

RESEARCH INTERESTS: Deep venous disease, peripheral arterial disease, aortic dissections, aortic aneurysms

FACULTY MENTOR: Jake Hemingway, MD

MEDICAL SCHOOL: University of California Los Angeles–David Geffen School of Medicine

HOMETOWN: Roy, UT

DISCUSSANT: Sara Zettervall, MD, MPH

RESULTS OF DEDICATED VENOUS STENTS IN TREATING CHRONIC INFERIOR VENA CAVA OCCLUSIONS

Wang KM, Murphy BE, Hemingway JF

BACKGROUND: Inferior vena cava (IVC) occlusions can result in debilitating symptoms including lower extremity pain, edema, and venous ulceration. This study describes outcomes associated with stenting of chronic IVC occlusions using dedicated venous stents.

METHODS: Patients who underwent endovascular recanalization and nitinol venous stenting at a single institution from 2022 to 2025 were identified. Demographics, disease severity, operative details, and outcomes were collected.

RESULTS: A total of 22 patients with symptomatic IVC occlusions underwent attempted recanalization. Median age was 41 years (IQR 37, 71) and patients were predominantly male (77%). Hypercoagulable disorders were present in 32% of patients. On presentation, 20 patients (91%) had post-thrombotic syndrome, 12 (55%) had CEAP class 4-6 chronic venous disease, 6 (27%) had occluded IVC filters, 4 (18%) had a prior failed venous intervention, and 5 (23%) had chronic prior stent occlusions. Etiology of chronic IVC occlusion included DVT in 13 patients (59%), IVC filter-associated thrombosis in 4 patients (18%), surgical-related IVC stenosis in 2 patients (9%), congenital abnormalities in 2 patients (9%), and IVC clipping in 1 patient (5%). Cranial extent of stenting suprarenal in 10 patients (48%). Common femoral veins were stented in 27 limbs (64% of limbs). Sharp recanalization was required in 3 patients (14%). 21 patients (95%) achieved technical success. All patients were anticoagulated postoperatively and median length of stay was 1 hospital day. Two patients (9.5%) experienced bleeding-related complications within 30-days. Median follow-up was 259 days (IQR 78, 473). Primary patency for the IVC stents was 100% at 12-months (Figure 1). Primary and secondary patency for all components within the venous

reconstruction was 86% and 100% at 1-year, respectively. All patients reported symptomatic improvement and venous ulcer healing within 1-year.

CONCLUSIONS: Treatment of chronic IVC occlusions using dedicated venous nitinol stents is safe with excellent mid-term patency and symptom improvement.

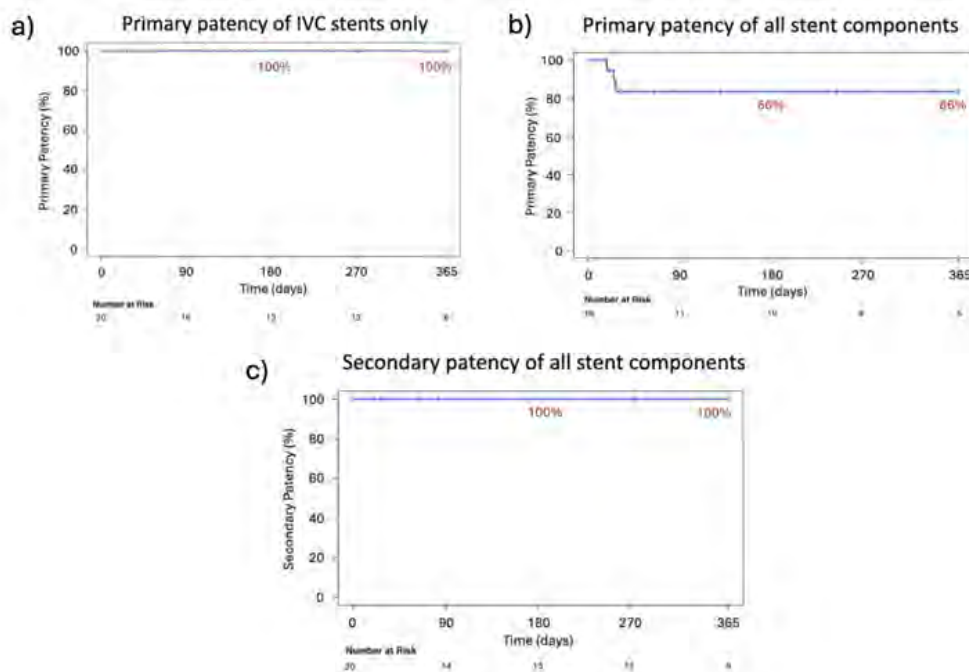


Figure 1. Primary patency of IVC stents only (a), primary patency of all stent components (b), and secondary patency of all stent components (c) at 1 year.

RESEARCH INTERESTS: Clinical prognostication, namely with resuscitation needs**FACULTY MENTOR:** Barclay Stewart, MD, PhD, MPH**MEDICAL SCHOOL:** Virginia Commonwealth University School of Medicine**HOMETOWN:** Durham, CA**DISCUSSANT:** Paul Comish, MD

REENVISIONING BURN SEVERITY ASSESSMENT: THE COMPUTER VISION-ENABLED BAYESIAN “UDJAT SCORE” OUTPERFORMS CONVENTIONAL BURN SEVERITY MEASURES

Cody McHargue, Max T Hukill, Barclay Stewart

BACKGROUND: Accurate quantification of burn severity is essential for prognostication, benchmarking, and quality improvement. Existing models—including the Revised Baux, Ryan, and Injury Severity Scores—depend on coarse clinical inputs that fail to capture the multidimensionality of burn injury. Although Lund–Browder charts routinely depict burn extent and depth, these visual data have never been systematically leveraged for quantitative severity scoring. We aimed to develop a computer vision–enabled Bayesian burn severity model, integrating color-coded burn diagrams with key clinical variables to predict in-hospital mortality: the UDJAT Score.

METHODS: We analyzed all adult burn admissions to the UW Medicine Regional Burn Center from 2021–2025. Digitized color-coded burn diagrams and clinical covariables were processed using a computer vision pipeline that quantified spatially weighted burn distributions and depth categories from standardized diagrams. These features were incorporated into a Bayesian Dirichlet regression to predict in-hospital mortality. Model performance was compared with Revised Baux, Ryan, and Injury Severity Scores using AUROC, calibration indices, and decision-curve analyses.

RESULTS: Among 1,830 patients, the UDJAT score demonstrated superior predictive performance for mortality (AUC = 0.92 vs ≤ 0.71). Calibration was excellent, and discriminative capacity remained robust across age strata, burn size categories, and inhalation-injury status. Feature attribution analyses showed that spatial distribution and depth-pattern metrics provided substantial predictive information.

CONCLUSIONS: Computer vision–enabled quantification of routine burn diagrams meaningfully improves the precision of burn severity assessment. Under a Bayesian framework, this approach surpasses all established scoring systems for predicting mortality. Its enhanced accuracy has significant implications for clinical care—prognosticating reliably, informing resource allocation, and guiding counseling. It strengthens risk-adjusted benchmarking across burn centers and elevates the methodological rigor of burn research by providing a highly objective, reproducible measure of injury severity.



JASON CARTER, MD, PHD

Research Resident

RESEARCH INTERESTS: Tumor immunology, computational biology

FACULTY MENTOR: Venu Pillarisetty, MD, FACS

MEDICAL SCHOOL: Stony Brook University School of Medicine

HOMETOWN: San Diego, CA

DISCUSSANT: Jeremy Sharib, MD

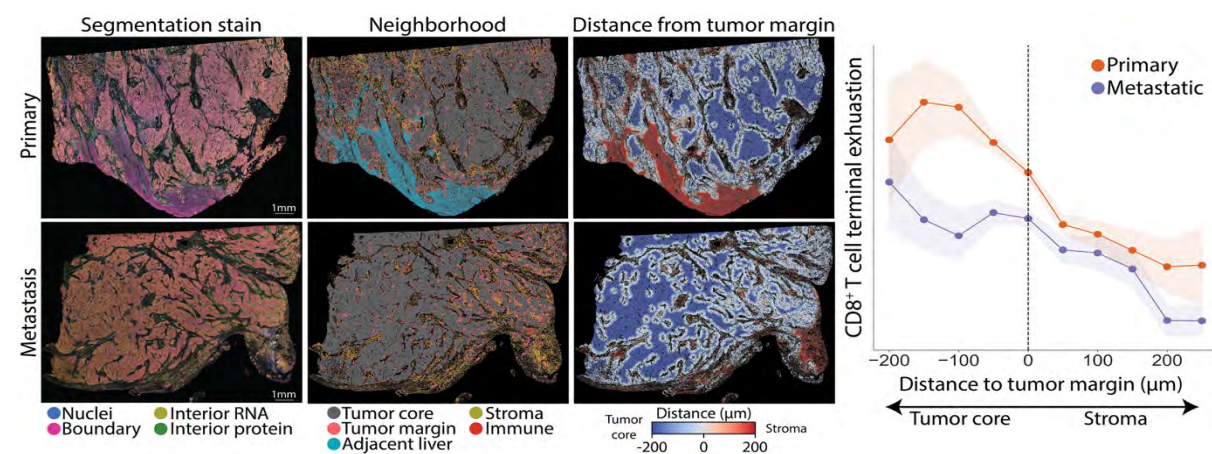
SINGLE-CELL AND SPATIALLY RESOLVED MULTI-OMICS IDENTIFY CLINICALLY TARGETABLE IMMUNOSUPPRESSIVE NICHES IN FIBROLAMELLAR CARCINOMA

Carter JA, Goodsell KE, Damle SR, Dickerson LK, Yeung RS, Crispe IN, Pillarisetty VG

BACKGROUND: Fibrolamellar carcinoma (FLC) is a rare but devastating form of liver cancer affecting otherwise healthy young adults. Despite a conserved and immunogenic fusion oncogene, patients with FLC paradoxically generate poor anti-tumor immune responses even following immunotherapy. While recent work has highlighted that intratumoral immunosuppression is mediated through both T cell exhaustion and immune exclusion, our mechanistic understanding of the underlying immune interactions that drive these phenotypes and how they can be therapeutically targeted remain incompletely characterized.

METHODS: Bulk and single-cell RNA sequencing, as well as high-dimensional flow cytometry, were used to comprehensively characterize intratumoral immune cell states from both primary and metastatic FLC samples. Immune phenotypes in tissue samples from 8 patients with paired primary and metastatic tumors were spatially mapped using an integrated spatial transcriptomics and proteomics approach.

RESULTS: Relative to adjacent non-tumor liver, both primary and metastatic FLC samples displayed profound immune dysregulation with marked increases in regulatory T cell (Treg) abundance and a TOX+ terminally exhausted T cell population. Comparing transcriptional states of over 3 million spatially resolved cells across 6 distinct cellular neighborhoods, we identified direct correlations between an individual cell's proximity to the tumor core and increased expression of gene signatures associated with T cell effector function, terminal exhaustion, and Treg activation (Figure). We further identify the formation of dendritic cell (DC): helper T cell: cytotoxic T cell three-cell-type clusters that we previously found to correlate with survival in pancreatic cancer. However, unlike in pancreatic cancer, three-cell-type clusters in FLC are strikingly enriched for adjacent Tregs that appear to drive a local terminal exhaustion phenotype.



CONCLUSIONS: Our findings demonstrate the importance of intratumoral cell-cell interactions in driving immune activation and exhaustion, as well as highlight specific molecular interactions that can be targeted to rationally design combination immunotherapy for FLC.

Figure. Representative images (left) showing spatial transcriptomics slide for paired primary (top) and peritoneal metastasis (bottom) by segmentation markers, cellular neighborhood, and distance from tumor boundary. Terminal exhaustion gene signature in cytotoxic T cells as a function of distance from tumor margin (right).



NASAL TIP SUPPORT MECHANISMS IN PRIMARY CLEFT RHINOPLASTY: A SYSTEMATIC REVIEW

Uriarte Mayorga MH

BACKGROUND: Sustained nasal projection, rotation, and symmetry are persistent requirements in cleft rhinoplasty due to inevitable distortions of cartilaginous anatomy, septal alignment, the scroll complex, and superficial ligamentous support. Although several surgical interventions have been described for the treatment of cleft nasal deformity, the mechanistic basis of how biomechanical aspects of these intervention modalities can affect nasal tip support have yet to be systematically defined. The objective of this study was to review and classify recent cleft rhinoplasty techniques considering the differences between them in regards to nasal tip support and their clinical outcomes.

METHODS: A systematic review guided by PRISMA using PubMed, Embase, and Cochrane databases was conducted. Studies were included that detailed primary cleft rhinoplasty and included explicit discussion about the support mechanisms of nasal tips. Data were obtained on cleft type, patient cohort, surgical intervention targeting cartilage, septal support, scroll complex, or superficial ligamentous connections, and the outcome of nasal tip projection, rotation, symmetry, and stability. Design of studies, level of evidence, and follow-up were evaluated.

RESULTS: The literature presents considerable variability in surgical techniques for nasal tip support within cleft rhinoplasty. Structural cartilage repositioning, septal stabilization, and scroll complex restoration interventions were more reliably and consistently associated with nasal projection and rotational stability. Soft tissue-based or suture-only strategies, on the other hand, demonstrated variable durability. Objective outcome variables were not consistently reported in all studies and follow-up data were generally limited.

CONCLUSIONS: The established cleft rhinoplasty literature shows a variety of measures that have been taken to treat nasal tip deformity with increased attention to the structural and biomechanical principles of support. The present systematic review consolidates and unifies current knowledge on nasal tip support mechanisms and their relation to clinical outcomes and identifies the lack of standardized outcome reporting and longitudinal assessment. In the context of cleft nasal reconstruction, these findings serve as a solid framework for guidance on surgical decision-making and for future biomechanical and clinical studies.



GRACE KENNEDY, MD

Postdoctoral Research Fellow

RESEARCH INTERESTS: Surgical outcomes, health policy, surgical equity

FACULTY MENTOR: Dave Flum, MD, MPH, FACS

MEDICAL SCHOOL: University of Alabama Birmingham

HOMETOWN: Birmingham, AL

DISCUSSANT: John Scott, MD, MPH

HOW IMMUNOCOMPROMISED ARE THEY? SEVERITY RANKING
IMMUNOCOMPROMISE CONDITIONS IN EMERGENCY GENERAL SURGERY

Kennedy GE, Allen GI, Davidson GH, Hantouli MN, Liu C, Flum DR

BACKGROUND: The prevalence of immunosuppression is rapidly rising among US adults and emergency general surgery patients. In 2021, international surgical societies (WSES, SIS-E, WSIS, AAST, and GAIS) published consensus guidelines classifying immunocompromised patients with acute abdomen into two categories. “Mild-moderate” includes elderly, malnourished, diabetic, burns, trauma, uremic, malignancy not on chemotherapy, HIV CD4 >200 and post-splenectomy patients. “Severe” includes AIDS, HIV CD4 <200, solid organ/bone marrow transplant, high-dose steroids, malignancy on chemotherapy, and neutropenia. This staging system was developed to guide surgical decision-making but has not been validated against procedure-specific mortality outcomes. We determined whether published mortality data support this classification.

METHODS: We searched PubMed and MEDLINE (2000-2025) for studies reporting mortality in adult immunocompromised patients undergoing emergency colectomy, cholecystectomy, appendectomy, or small bowel resection. Reference lists were reviewed for additional studies. Studies were included if they reported 30-day or in-hospital mortality with a non-immunocompromised control group. For each immunocompromise category, we calculated procedure-specific fold-increase in mortality risk and assessed whether observed mortality patterns were consistent with the “mild-moderate” versus “severe” classification.

RESULTS: Of 168 articles identified, 60 met inclusion criteria. Mortality data were inconsistent with the consensus classification for several conditions. Among “mild-moderate” categories, uremia (4-7x increased mortality) and advanced age (3-5x) demonstrated mortality risk exceeding 3x which may warrant reclassification as severe. Among “severe” categories, transplant (1-1.5x) and HIV CD4 <200 (2-2.5x) showed lower mortality risk, more consistent with mild-moderate classification. Neutropenia (up to 10x) and steroids (3-6x) supported their severe classifications. Significant evidence gaps existed for post-splenectomy, trauma, burns, and malignancy without active chemotherapy.

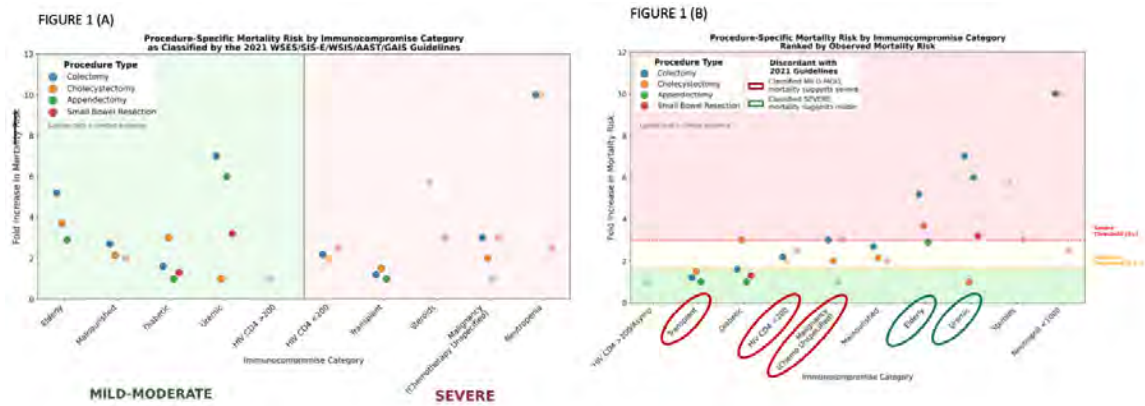


Figure 1. Procedure-specific mortality risk across immunocompromise categories. (A) Mortality risk organized by 2021 consensus classification (mild-moderate vs. severe). (B) IC category ordered by observed mortality risk.

CONCLUSIONS: Published procedure-specific mortality data do not consistently support the 2021 expert consensus immunocompromise staging system. Several conditions demonstrate mortality risk discordant with their assigned classification, suggesting that evidence-based refinement of immunocompromise severity ranking is needed in emergency general surgery.

KATE MCNEVIN, MD

Pediatric Research Fellow

RESEARCH INTERESTS: Pediatric colorectal disorders

FACULTY MENTOR: Caitlin Smith, MD

MEDICAL SCHOOL: University of Washington School of Medicine

HOMETOWN: Spokane, WA

DISCUSSANT: Patrick Javid, MD



ONE-YEAR OUTCOMES FOR PATIENTS UNDERGOING ANTEGRADE CONTINENCE ENEMA (ACE) PROCEDURES WITHOUT PRIOR RECTAL ENEMA THERAPY: A PCPLC STUDY

McNevin, KE, McClure, PL, Avansino, J, Rice-Townsend, S, Smith, CA

PURPOSE: Antegrade continence enema channels are a crucial tool to achieve continence in pediatric patients with a variety of colorectal disorders. Historically, patients underwent rectal enemas prior to undergoing ACE channel creation. Higher volume colorectal centers have shifted this practice pattern toward an initial ACE procedure without prior demonstration of successful bowel management with rectal enemas for some patients, especially those noncompliant or intolerant of rectal enemas. The aim of this study was to describe this patient population and evaluate the success of this approach.

METHODS: A retrospective study was performed to evaluate patients who underwent a primary antegrade continence enema channel at a PCPLC institution (2017-2024). Patients were excluded if they had a redo ACE or an ostomy prior to ACE procedure.

RESULTS: Eighty patients had an ACE procedure without first undergoing a rectal enema program. The median age at the time of ACE was 7.7 years. Diagnoses included anorectal malformation (N=45, 56.3%), Hirschsprung disease (N=8, 10%), and functional constipation (N=27, 33.8%). Half of the patients had an associated developmental or behavioral disorder. Thirty-day (7.5%) and 1 year (13.7%) complication rates were low. At one year, 27 patients (34%) were completely clean and 7 (9%) had < one accident per week. Six patients (7.5%) had discontinued ACE flushes.

CONCLUSION: Early experience with upfront ACE was associated with a low rate of complications and successful bowel management in approximately half of the patients. Long-term follow up is needed to further evaluate success rates and identify appropriate patients for this approach.



NICOLAS STAFFORINI, MD

Vascular Surgery Chief Resident

RESEARCH INTERESTS: Vascular trauma, complex aortic disease, ruptured abdominal aortic aneurysms, health disparities within vascular surgery

FACULTY MENTOR: Jake Hemingway, MD

MEDICAL SCHOOL: Instituto Universitario Cemic

HOMETOWN: Buenos Aires, Argentina

DISCUSSANT: Matthew Smith, MD, PhD

MODERN MANAGEMENT AND OUTCOMES OF PENETRATING UPPER EXTREMITY ARTERIAL INJURIES AT A LEVEL I TRAUMA CENTER

Nicolas A. Stafforini MD, Louis Darkwa MD, Nam Tran MD, Benjamin Starnes MD, Elina Quiroga MD MPH, Niten Singh MD, Jake Hemingway MD

BACKGROUND: Penetrating upper extremity (PUE) arterial injuries remain a significant challenge and are frequently associated with damage to surrounding structures. This study aims to analyze a contemporary cohort of patients with PUE arterial trauma treated at a high-volume level I trauma center.

METHODS: We conducted a single-center retrospective review of all patients presenting to our institution with PUE arterial injuries between 2017 and 2023. Demographics, clinical features, procedural details, and outcomes were recorded.

Table 1

Demographic features of patients presenting with upper extremity penetrating arterial injury

	Patients=137
Male, n (%)	111 (81)
Age in years, Median (range)	34 (1-79)
Transferred from another hospital, n (%)	60 (44)
Mechanism	
Gunshot Wound, n (%)	44 (32)
Stab wound, n (%)	42 (31)
Glass injury, n (%)	30 (22)
Saw injury, n (%)	7 (5)
Other, n (%)	14 (10)
Self-inflicted, n (%)	33 (24)
Hypertension, n (%)	8 (6)
Hyperlipidemia, n (%)	3 (2)
Chronic Obstructive Pulmonary Disease, n (%)	1 (1)
Diabetes Mellitus, n (%)	3 (2)
Coronary Artery Disease, n (%)	1 (1)
Chronic Kidney Disease, n (%)	1 (1)
Smoking, n (%)	68 (49)
Preoperative CT (%)	50 (36)
Arterial injury	147
Subclavian, n (%)	2 (1)
Axillary, n (%)	10 (7)
Brachial, n (%)	42 (29)
Radial, n (%)	53 (36)
Ulnar, n (%)	40 (27)
Hard signs of Vascular Injury, n (%)	97 (71)
Associated nerve injury, n (%)	73 (53)
Associated bone injury, (n) %	17 (12)
Associated venous injury, n (%)	36 (26)
Abnormal Vascular Exam, n (%)	68 (50)
Abnormal Sensory Exam, n (%)	57 (42)
Abnormal Motor Exam, n (%)	51 (37)
Rutherford 1	68 (50)
Rutherford 2a	8 (6)
Rutherford 2b	19 (14)
Rutherford 3	2 (1)

RESULTS: A total of 137 patients with 147 PUE arterial injuries presented during the study period. The majority were male (81%) and (44%) were transferred from another hospital. The most common mechanism of injury was gunshot wounds (32%) and the radial artery was the most affected vessel (36%). 71% of patients presented with hard signs of vascular injury and preoperative CT imaging was obtained in 36% of patients.

Associated injuries were common, as 53% had concomitant nerve injuries, 26% had venous injuries, and 12% had bone injuries. Abnormal vascular exams were documented in 50% of patients, while 42% had an abnormal sensory exam and 37% motor deficits. Of the 137 patients, 68 (50%) were classified as Rutherford 1, 8 (6%) as Rutherford 2a, 19 (14%) as Rutherford 2b, and 2 (1%) as Rutherford 3.

The majority of injuries (n=143) underwent open surgical repair (97%), while endovascular repair was performed in 3% of injuries. Fasciotomies were performed in 16%. Limb salvage was achieved in 99% of patients, with only 1 patient requiring a major amputation within 30 days. No late amputations were required. There were no 30-day mortalities. Follow-up within the first 30 days was obtained for 74% of patients, and 58% of these had major functional deficits.

CONCLUSIONS: Although limb salvage rates following PUE arterial injuries are high, a significant proportion of patients experience functional deficits. These findings highlight the importance of a timely diagnosis and multidisciplinary management of these complex injuries.



LANGUAGE BARRIERS IMPACT PREHOSPITAL INTUBATION AFTER TRAUMA

Alexandra Hernandez, Nina Clark, John W Scott, Thomas Rea, Micheal Sayre, Eileen M Bulger, Bryce RH Robinson

BACKGROUND: Communication barriers caused by limited English proficiency (LEP) have been attributed to negative health outcomes, but the effects of LEP on pre-hospital outcomes for trauma patients is unclear.

METHODS: We conducted a single center retrospective study including all adult trauma patients transported from the scene of injury by EMS between 2018-2024, excluding interfacility transfers, air transport, and severe head injury. LEP was defined as non-English primary language. Multivariable logistic regression was used to evaluate EMS intubation, adjusted for age, sex, race, blunt v. penetrating trauma, distance, and severe head, neck, chest, and abdominal injury. Multivariable negative binomial regression was used to calculate differences in hospital length of stay (LOS), ICU LOS, and ventilator days.

RESULTS: Of 11,524 included patients, 1,102 had LEP. LEP trauma patients were significantly more likely to be intubated by EMS (15.3%) than their English-proficient counterparts (13.2%) (aOR= 1.23, 95% CI:1.01-1.52). This finding was persistent in sensitivity analyses on subpopulations of race, negative toxicology, and low injury severity (AIS head, neck, chest, abdomen ≤ 3). LEP patients had greater ventilator days, and ICU LOS ($p < 0.05$), yet there was no difference in mortality or hospital LOS (Table).

CONCLUSION: After adjusting for injury and demographics, patients with LEP had a higher rate of intubation in the pre-hospital setting, which may contribute to excess ventilator use and ICU length of stay.

Table. Clinical Outcomes by Language Status Among Patients Transported by EMS

Outcome	LEP Mean (SD), %	English-Proficient Mean (SD), %	Adjusted OR / Adjusted Mean Difference	p-value**
Pre-hospital Intubation	15.3%	13.2%	1.23	0.04
Ventilator days*	1.5 Days (6.6)	0.9 Days (4.4)	0.4 Days	0.015
ICU LOS*	2.2 Days (7.2)	1.6 Days (5.4)	0.5 Days	0.004
Hospital LOS*	8.9 Days (19.2)	7.5 Days (15.5)	0.5 Days	0.16
Mortality*	4.3%	4.1%	0.81	0.26

*Ventilator Days, Hospital LOS, ICU LOS, and Mortality outcomes adjusted for insurance payer in addition to all other covariables listed. **P-value for the adjusted mean difference or aOR.



ISRA ABDULWADOOD, MD

Plastic Surgery R1

RESEARCH INTERESTS: Microvascular reconstruction, bioethics in plastic surgery

FACULTY MENTOR: Otway Louie, MD

MEDICAL SCHOOL: Mayo Clinic Alix School of Medicine

HOMETOWN: Dallas, TX

DISCUSSANT: Jeffrey Friedrich, MD, MC, FACS

NAVIGATING HEMODYNAMIC RISK FOLLOWING DEEP INFERIOR EPIGASTRIC ARTERY PERFORATOR FLAPS IN THE BLOOD PRODUCT DECLINING PATIENT

Abdulwadood I, Kalaf NC, Shen AH, Wang D, Lentz RB, Louie O

BACKGROUND: The deep inferior epigastric perforator (DIEP) free flap surgery remains the gold standard for autologous breast reconstruction. Nevertheless, it is an elective major microvascular procedure that requires careful preoperative planning, risk assessment, and patient selection. An important consideration is discussing the risk of intraoperative blood loss, including the likelihood of requiring blood products perioperatively. Challenges arise when patients present with restrictions in their ability to accept blood products, creating an ethical tension between patient autonomy and surgical safety. This case series aims to discuss the perioperative considerations and outcomes for patients who voluntarily pursue DIEP flap-based breast reconstruction while simultaneously refusing some or all blood products.

METHODS: Retrospective review of patients who identify as Jehovah’s Witnesses and underwent elective DIEP free flap surgery at a single institution was conducted. Data on preoperative counseling and hospital courses were collected.

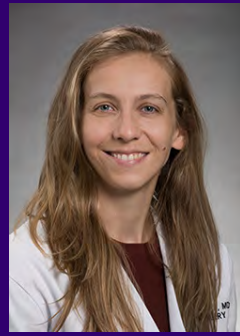
RESULTS: A total of 12 patients met inclusion criteria for this study. The average age at the time of surgery was 50.2 ± 8.5 (range 35 - 61) and average hospitalization was 3.9 ± 1.7 days (range 2 - 8). All patients signed documentation indicating their preference to decline blood products. The administration of postoperative intravenous fluids varied among the cohort, with a median daily resuscitation volume of 1550mL (range: 1001 – 3025 mL). Postoperatively, 2 patients’ (16.7%) courses were complicated by a hematoma requiring operating room takeback and involved repeat discussions to reaffirm their preference to decline blood products after meeting criteria for blood transfusion.

CONCLUSIONS: These findings emphasize the importance of preoperative planning and expectation management for patients who decline blood products when pursuing major elective surgeries. Given the wide variability in hemodynamic status and resuscitation needs across patients, proposed strategies such as optimizing preoperative blood counts, reducing excessive postoperative blood draws, and utilizing intraoperative agents such as tranexamic acid, may be considered.

Table 1. Hospital course by patient

	Intra-operative pressors administered	EBL	Total Inpatient IVF administered (mL)	Average IVF administered per day of hospitalization (mL)	Inpatient complications
Patient 1	Yes	150	18150	3025	None
Patient 2	Yes	100	7430	2478	None
Patient 3	Yes	100	6214	1554	Hematoma
Patient 4	Yes	100	11262	2815	None
Patient 5	No	150	3340	1113	None
Patient 6	Yes	50	7202	2401	Hematoma
Patient 7	Yes	50	5938	1188	None
Patient 8	Yes	150	4638	1546	None
Patient 9	Yes	40	2350	1175	None
Patient 10	Yes	100	8006	1001	Hematoma
Patient 11	No	150	5314	1771	None
Patient 12	Yes	100	3850	1283	None

Abbreviations: EBL – estimated blood loss; IVF – intravenous fluids



RESISTANCE TO IMMUNOTHERAPY IN COLORECTAL LIVER CANCER METASTASES: ARE SPP1+ MACROPHAGES INNOCENT BYSTANDERS OR CRIMINAL MASTERMINDS?

Goodsell KE, Carter JA, Damle SR, Cernak J, Mostales J, Jiang X, Kenerson HL, Yeung RS, Crispe IN, Pillarisetty VG

BACKGROUND: While surgery and multimodal chemotherapy have improved outcomes for patients with colorectal cancer liver metastases (CRLM), response to immunotherapy is rare. Recently, *SPP1*+ macrophages have been implicated in immunotherapy failure in other cancers. We hypothesized that osteopontin (encoded by the *SPP1* gene) secretion by these macrophages drives immunotherapy resistance in CRLM.

METHODS: Bulk (n=33) and single-cell (n=11) RNA sequencing (RNAseq), and slice culture supernatant analyses (n=7) were performed on human CRLM samples. Multiplex immunohistochemistry (mIHC) was performed to identify cells within tumor tissue. Cases were stratified by levels of *SPP1*/osteopontin gene expression (*SPP1*^{high} and *SPP1*_{low}) and *in vitro* response to immune activation by IL-10 blockade.

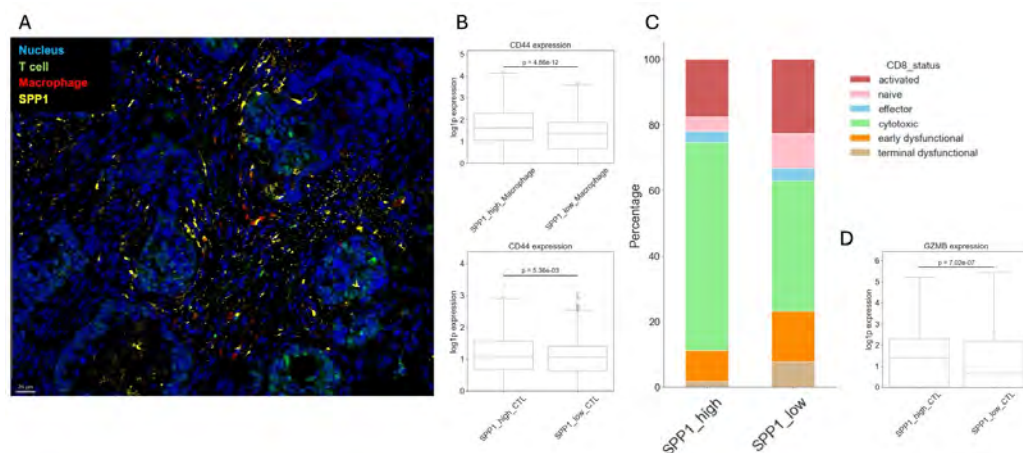
RESULTS: *SPP1*+ macrophages were identified by mIHC and gene expression (Figure 1A). Interestingly, gene expression for the primary osteopontin receptor (*CD44*) was greater in CD8+ T cells and macrophages in *SPP1*^{high} samples, suggesting potential paracrine and autocrine signaling (Figure 1B).

In *SPP1*^{high} cases, there were more CD8+ T cells with cytotoxic gene expression (*GZMB*^{high}); in *SPP1*_{low} cases, a greater proportion of CD8+ T cells had naïve (*CCR7*+), early dysfunctional (*PD1*+*CD39*-), or terminal dysfunctional (*PD1*+*TOX*+*CD39*+) signatures (Figure 1C-D).

With immune activating treatment, osteopontin levels significantly decreased among responders (Δ OPN = -60.2%, p-value < 0.05) compared to non-responders (Δ OPN = 6.2% p-value = 0.70). The majority of *SPP1*^{high} cases responded to immune activation; conversely, most *SPP1*_{low} cases showed no benefit.

Conclusions: *SPP1*+ macrophages are present in CRLM and are associated with variation in T cell phenotypes and response to immune activation. We are currently testing the effects of an osteopontin neutralizing antibody on anti-tumor immunity in a mouse model of CRLM.

Figure 1. *SPP1*+ macrophages are identified in CRLM (A). Higher levels of *SPP1* are associated with higher expression of osteopontin receptor transcripts in macrophages and T cells (B) and more cytotoxic, less dysfunctional CD8 T cell gene signatures (C, D).





BLAKE MURPHY, MD

Research Resident

RESEARCH INTERESTS: Health outcomes, quality and improvement, health policy

FACULTY MENTOR: Sara L. Zettervall, MD, MPH

MEDICAL SCHOOL: Stritch School of Medicine

HOMETOWN: Chicago, IL

DISCUSSANT: Elina Quiroga, MD, MPH

LONG TITLE: IN-HOSPITAL VASCULAR SURGERY CONSULTATION IS ASSOCIATED WITH IMPROVED FOLLOW-UP AND EARLIER IDENTIFICATION OF ANEURYSMAL DEGENERATION AFTER ACUTE TYPE A AORTIC DISSECTION

Lee AE, Stone KW, Murphy BE, DeRoo SC, Burke CR, Smith MC, Sweet MP, Zettervall SL

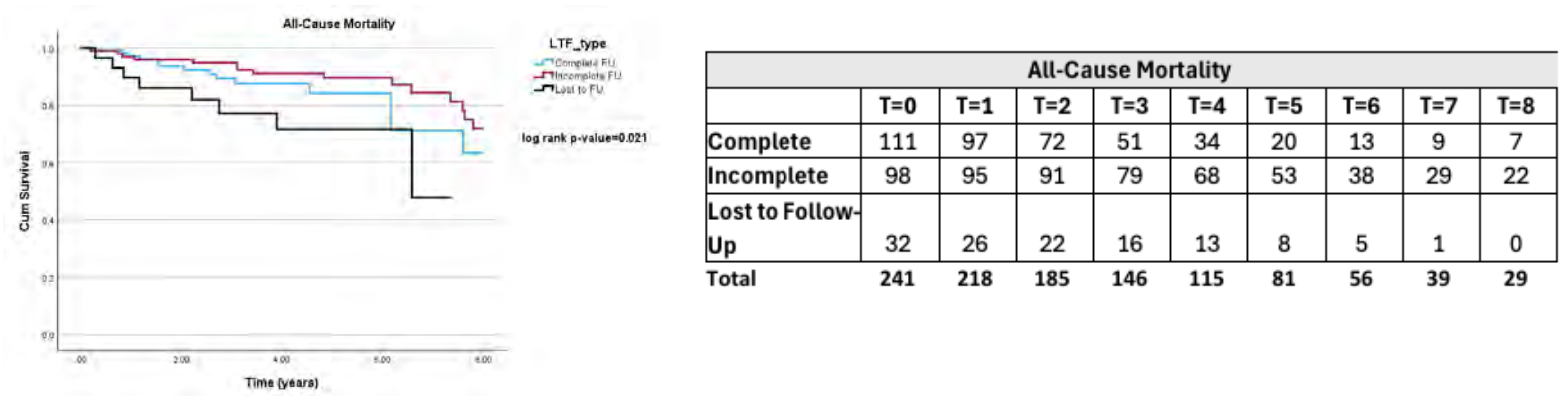
BACKGROUND: While type A aortic dissections (TAAD) are historically managed by cardiac surgery, treatment with multidisciplinary teams has been shown to improve longitudinal care for patients with aortic disease. This study assesses the impact of vascular surgery consultation on follow-up and long-term outcomes following treatment for acute TAAD.

METHODS: Patients treated for acute TAAD extending distal to Zone 1 from 2014-2025 were included. Vascular surgery evaluation was documented, and the time of consultation assessed (index-hospitalization, outpatient, none). Follow-up was classified as complete, incomplete, or lost (LTF) according to recommended frequency of contrasted thoracoabdominal imaging. Demographics, perioperative characteristics, and long-term outcomes were compared.

RESULTS: 241 patients were included, 80% had vascular surgery consultation (70% inpatient, 30% outpatient) and 86% of consultations occurred within 1-year of index procedure. In total, 46% of patients had complete follow-up, 41% had incomplete follow-up, and 13% were LTF. Patients with complete follow-up had higher rates of complex arch repair (complete 56% vs. incomplete/LTF 29%, $p<0.001$), fewer perioperative strokes (complete 14% vs incomplete/LTF 25%, $p=0.048$), and were more likely to undergo genetic testing (complete 53% vs. incomplete/LTF 18%, $p<0.001$) and TEVAR extension within 3 months (complete 17% vs. incomplete/LTF 5%, $p=0.002$). Complete follow-up was associated with more planned secondary interventions (complete 12% vs. incomplete/LTF 5%, $p=0.007$) and identified aneurysmal degeneration (complete 32% vs. incomplete/LTF 15%, $p=0.002$) within 1-year of acute dissection. All-cause mortality at 1-year (complete 2.7%, incomplete 3.1%, and LTF 9.4%) and 5-years (complete 9.9%, incomplete 9.2%, LTF 21.9%, $p<0.021$) differed by completeness of follow-up (Figure IV, $p=0.021$). In-hospital vascular surgery consultation (HR 2.87, 95% CI 1.6-5.1) was associated with complete follow-up.

CONCLUSION: In-hospital vascular surgery consultation is associated with improved long-term follow-up, increased identification of aneurysmal degeneration, and long-term survival. These data suggest in-hospital vascular surgery involvement may optimize postoperative surveillance and patient outcomes following treatment for acute TAAD.

Figure I. Kaplan-Meier survival curve for all-cause mortality following acute Type A aortic dissection based on vascular surgery follow-up status



**RESEARCH INTERESTS:** Pediatric surgery, health equity**FACULTY MENTOR:** Sarah Greenberg, MD, MPH**MEDICAL SCHOOL:** University of California San Diego School of Medicine**HOMETOWN:** Baltimore, MD**DISCUSSANT:** André Dick, MD, MPH

MEASURING CLINICIAN'S EQUITY FOCUSED BEHAVIORS

Erica Johnson, Sarah LM Greenberg

PURPOSE: Healthcare inequities for children are widespread. Clinician engagement is essential to address these inequities and optimize outcomes. However, limited data exist assessing measurement of clinician equity-focused behaviors. Participants in GATHER™ – an equity-focused quality improvement intervention – have demonstrated statistically significant improvements in frequency of self-assessed equity-focused behaviors. We sought to validate self-assessments using three measures: interpreter use, direct observation, and 360-degree feedback. We hypothesized these methods would mirror self-assessments.

METHODS: Data for clinicians enrolled in GATHER™ between 9/2021-8/2025 were included. Odds of interpreter use were compared between GATHER™ participants and non-participants. Direct observation of participant behavior during inpatient rounds was completed and inter-rater reliability assessed using Fleiss's kappa. Selected evaluators completed 360-degree surveys for participants and mixed effects logistic regression modeled probability of engagement in equity-focused behaviors pre- and post-intervention. Correlations between self-assessed and evaluator-assessed responses overtime were examined.

RESULTS: There were 259 unique GATHER participants in the study period. High frequency of interpreter use was observed with no statistically significant difference between waitlisted clinicians, active participants, and graduates. Direct observation found low inter-rater reliability for all questions, with less than chance agreement leading to discontinuation of this method. For 360-degree feedback, 14.8% of evaluators at baseline and 40% on follow-up reported they could not adequately evaluate participants. 34% of evaluators reported no prior equity training. No significant correlation between self-assessment and 360-degree feedback was identified.

CONCLUSION: Measuring clinician equity-focused behaviors is nuanced and challenging. Interpreter metrics were limited by difficulty in capturing use across different care settings and attributing use to individual providers, as well as lack of identified gold standards. Direct observation encountered observer subjectivity, low inter-rater reliability, and limited assessment through a rounding setting. 360-degree feedback was limited by ceiling effects and poor evaluator-reported skillsets to assess participants. Further work is needed to determine effective measurement of clinician equity-focused behaviors.



JOSHUA MOSTALES, MD

Research Resident

RESEARCH INTERESTS: Lung cancer diagnostics, treatment selection, and patient-centered outcomes

FACULTY MENTOR: Jonathan Sham, MD, MBEE

MEDICAL SCHOOL: University of Hawaii John A. Burns School of Medicine

HOMETOWN: Saipan, Commonwealth of the Northern Mariana Islands

DISCUSSANT: Venu Pillarisetty, MD, FACS

IMPACT OF NEOADJUVANT TREATMENT LOCATION ON PATIENT OUTCOMES IN A REGIONAL PANCREAS CANCER MULTIDISCIPLINARY CLINIC

Joshua C Mostales, MD, Sardar Shahmir B Chauhan, MBBS, Nina M Clark, MD, Amy Wang, BS,
Elena G Chiorean, MD, Andrew L Coveler, MD, Jonathan G Sham, MD, MBEE

BACKGROUND: High-volume centers such as the Fred Hutchinson Cancer Center (FHCC) have been reported to achieve superior surgical outcomes in patients with pancreatic ductal adenocarcinoma (PDAC). However, the impact of where patients receive neoadjuvant chemotherapy (NAT) after multidisciplinary evaluation remains unclear. Many patients residing significant distances from FHCC express concern that receiving NAT at a center closer to home may reduce their likelihood of surgical resection or worsen their oncologic outcome.

METHODS: A retrospective cohort study was conducted on treatment-naïve PDAC patients evaluated at the Fred Hutch Cancer Center (FHCC) between 2017 and 2022. Patients were stratified by NAT location (FHCC vs non-FHCC). Demographic and clinical information was collected from patients' electronic medical records.

RESULTS: Of 189 eligible patients, 119 (63%) received NAT at the FHCC and 70 (37%) at other facilities. On multivariate logistic regression, patients with a >50% reduction in serum CA19-9 levels during NAT were more likely to undergo surgery (OR 2.92, 95% CI 1.20-7.07, $p=0.018$). Patients were less likely to undergo surgery in the presence of locally advanced disease (OR 0.15, 95% CI 0.04-0.52, $p=0.003$), if they received gemcitabine-based chemotherapy (OR 0.30, 95% CI 0.10-0.94, $p=0.038$), or second-line chemotherapy (OR 0.05, 95% CI 0.02-0.13, $p<0.001$). Compared to patients who received NAT at FHCC, those receiving NAT at a non-FHCC location had a similar likelihood of surgical resection (OR 0.99, 95% CI 0.43-2.31) and overall survival (20.0 vs 19.0 months, $p=0.186$).

CONCLUSIONS: After initial evaluation for PDAC at FHCC, receiving NAT at a non-FHCC location was not associated with inferior rates of surgical resection or overall survival. Disease biology and response to treatment drive surgical eligibility and survival. Providers should counsel patients that receiving NAT at a non-FHCC location is safe and should not adversely affect oncologic outcomes.



PREDICTING NODAL DISEASE AMONG PATIENTS WITH LUNG CANCER

Rudasill SE, Schmicker RH, Greenlee RT, Silvestri GA, Gould MK, Heagerty PJ, Pipavath SN, Baik CS, Zeng J, Veenstra DL, Wood DE, Velotta JB, Sakoda LC, Farjah F

BACKGROUND: Practice guidelines utilize four imaging findings to identify patients with non-small cell lung cancer (NSCLC) who should undergo pretreatment invasive nodal staging. While effective at detecting true nodal disease, guidelines direct many patients without nodal disease to a potentially avoidable biopsy. Prediction models instead integrate patient and imaging factors to estimate individualized risk. We developed and validated a novel prediction model and compared it with an existing model and the guideline-recommended strategy, hypothesizing that a risk-based approach would outperform guidelines.

METHODS: We conducted a cohort study of adults with non-metastatic NSCLC (2010-2021) staged by computed tomography and positron emission tomography in the four months preceding treatment. We utilized SuperLearner, a prediction method that evaluates multiple algorithms to identify the best-performing prediction model (ICONS). ICONS was compared to guideline criteria and an existing risk-prediction model (Verdial). Statistical performance was assessed using c-statistic, calibration tests, and the Brier score. Clinical performance compared how often invasive nodal staging was recommended for node-negative patients and overall biopsy frequency.

RESULTS: Among 3,080 patients (median age 70 years; 58% female), ICONS utilized Bayesian Additive Regression Trees, the top-performing algorithm across all five SuperLearner cross-validations. This approach to risk-prediction was superior to an existing prediction model per the c-statistic and goodness-of-fit test (Table). Matched to the guideline-recommended false negative rate, ICONS yielded fewer biopsy recommendations for node-negative individuals (65%, 95% confidence interval (CI) 63–66% versus guidelines, 74%, 95%CI 72–76%) and a lower overall biopsy rate (72%, 95%CI 70–74% versus guidelines, 79%, 95%CI 78–80%). The Verdial risk-prediction model performed comparably to guidelines. A post-hoc analysis identified a parsimonious risk-based strategy with similar statistical and clinical performance as ICONS but with only five predictors.

CONCLUSIONS: A risk-based approach to selecting patients with NSCLC for pretreatment invasive nodal staging was superior to existing practice guidelines.

Table. Statistical and Clinical Performance of Prediction Models Relative to a Guideline-Recommended Strategy for Selecting Patients for Invasive Nodal Staging

	Statistical Performance		
	C-statistic (95% CI)	Hosmer-Lemeshow Goodness of Fit	Brier score
Verdial Model ¹	0.75 (0.73 – 0.77)	0.05	0.16
Full ICONS Model ²	0.81 (0.79 – 0.82)	0.14	0.14
Simple ICONS Model ³	0.80 (0.78 – 0.82)	0.82	0.15
	Clinical Performance		
	False Negative Rate	False Positive Selection Rate (95% CI)	Expected Overall Rate of Invasive Nodal Staging (95% CI)
NCCN Guideline Selection Strategy	6.5%	74% (72% - 76%)	79% (78% - 80%)
Verdial Model ¹	6.5%	71% (69% - 73%)	77% (75% - 78%)
Full ICONS Model ²	6.5%	65% (63% - 66%)	72% (70% - 74%)
Simple ICONS Model ³	6.5%	66% (64% - 68%)	73% (72% - 74%)

CI = Confidence Interval; NCCN = National Comprehensive Cancer Network (imaging guidelines: tumor >3cm, central tumor, or CT/PET lymphadenopathy)

¹Verdial model = a five variable model previously published by Dr. Francys Verdial: tumor size and standardized uptake value (SUV_{max}), central location, hilar or mediastinal lymphadenopathy or fluorodeoxyglucose (FDG) uptake

²Full ICONS Model = Improving Lung Cancer Outcomes with Nodal Staging, twelve variable model: age, tumor size and SUV_{max}, central tumor, lobar location, tumor invasion, CT/PET lymphadenopathy, CT/PET nodules, tobacco use, prior malignancy

³Simple ICONS Model = a simplified five variable model: lymphadenopathy on PET, SUV_{max}, central tumor, tumor size, and age



GRIFFEN ALLEN, MD, MBE

Postdoctoral Research Fellow

RESEARCH INTERESTS: Surgical and economic outcomes in colorectal and emergency general surgery

FACULTY MENTOR: Dave Flum, MD, MPH, FACS

MEDICAL SCHOOL: Medical College of Georgia

HOMETOWN: Valdosta, GA

DISCUSSANT: John Scott, MD, MPH

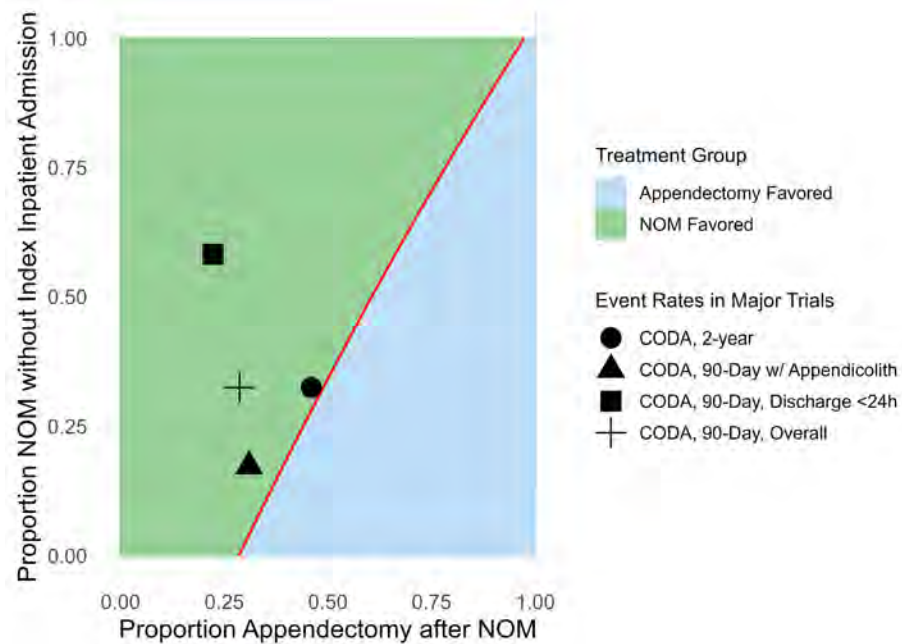
IS THE USE OF ANTIBIOTICS FOR THE TREATMENT OF APPENDICITIS REALLY COST SAVING? A COST ANALYSIS OF THE COMPARISON OF OUTCOMES OF ANTIBIOTIC DRUGS AND APPENDECTOMY (CODA) TRIAL

Allen GI, Hantouli MN, Nash MG, Mehrabian D, Davidson GH, Flum DR, Kessler LG

BACKGROUND: The CODA trial demonstrated that antibiotics are non-inferior to appendectomy for appendicitis, but the cost implications of non-operative management (NOM) remain unknown. We aimed to assess the costs of NOM compared to appendectomy and factors associated with the cost of NOM.

METHODS: We conducted a cost analysis of the 90-day of the CODA trial participants by applying costs from the MarketScan Database to the healthcare utilization events of trial participants. Inpatient utilization was ascertained through the total hospital payments of appendicitis patients observed within MarketScan matched by time frame (index visit or delayed), length-of-stay, and cohort (NOM/surgery). Itemized outpatient/pharmacy payments were obtained and used in the same manner. Costs were calculated for key groups within the trial using individual total estimated costs of participants. One and two-way sensitivity analyses examined how varying ED discharge rates and rates of appendectomy after NOM affected costs

RESULTS: The total median direct healthcare costs for NOM patients were \$16,534 (95% CI: 15,330-17,738) compared to \$19,936 (95% CI: 19,454-20,418) for appendectomy. NOM patients who underwent an appendectomy within 90 days of diagnosis had higher associated costs than those who did not or appendectomy patients (\$30,166 [95% CI:27,185-33,147] vs \$11,047 [95% CI: 10,279-11,815]). Sensitivity analyses showed that appendectomy after NOM and discharges without admission had the greatest impact on costs. A two-way sensitivity analysis varying these parameters demonstrates the cost threshold for no longer favoring NOM in alternative scenarios (figure 1).



CONCLUSION: NOM resulted in less healthcare costs compared to appendectomy through 90 days. The cost of NOM varies based on rates of initial hospitalization and eventual appendectomy. Future work will assess the out-of-pocket patient costs of NOM to determine its direct financial impact.

Figure 1. Two-Way Sensitivity Analysis for Non-Operative Patients by Rates of Appendectomy after Non-Operative Management and Index Disposition (Inpatient vs Home)

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