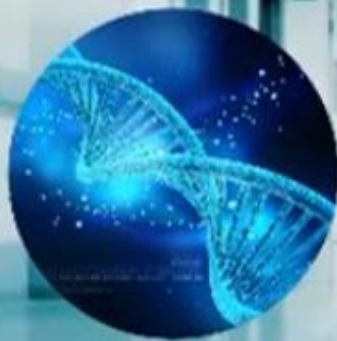# Jacobs School of Medicine and Biomedical Sciences
University at Buffalo

Department of Surgery

20th ANNUAL RESEARCH DAY

THURSDAY, MAY 23, 2024

Steven D. Schwaitzberg, MD
Distinguished Professor and Chairman

W. Alan Guo, MD, PhD
Clinical Professor

The 20th Annual UB Department of Surgery Research Day, 2024

Welcome to the 20th Annual University at Buffalo Department of Surgery Research Day. This day represents an opportunity for all members of the medical community to get a bird's-eye view of the research efforts taking place in the University at Buffalo Department of Surgery. The Department of Surgery Research Day is our annual celebration of the scientific advancements achieved by our surgeons, scientists, residents, and students. Over the past several years, our Research Day has become much more than a mere celebration; it has become an opportunity for the faculty and residents to strengthen existing partnerships and establish new collaborations across the clinical and academic realm. There are three cornerstones of academic medicine: clinical expertise, scientific discovery, and clinical teaching. These goals are interdependent. Clinical expertise relies on both scientific discovery and clinical teaching, while scientific discovery, in turn, can be informed by clinical experience. Our Research Day promotes and celebrates these types of exchanges. This year we have a total of 49 abstracts, which include 17 formal oral presentations and 32 poster presentations. Each of these abstracts include research that was conducted by the Department of Surgery medical students, residents, and faculty at all sites, including Buffalo General Medical Center, Erie County Medical Center, Roswell Park Comprehensive Cancer Center, John R. Oishei Children's Hospital, and the VA Medical Center. Research is an important part of our academic mission. We are making progress developing a strong research base. The faculty at the Department of Surgery at SUNY Buffalo is committed to research in their own careers and to help residents develop as surgeon-scientists through support and mentorship. Our faculty members continue to sit on prestigious editorial boards of national journals, hold extramural funding from national agencies, as well as funding from health care industries. In this rich academic and collaborative environment, we are committed to developing future leaders in academic surgery and clinical practice. We hope you enjoy the 20th Annual University at Buffalo Department of Surgery Research Day, as we take the challenge of improving the quality of life for patients by embracing both basic science research and clinical outcomes to tailor new directions in translational research.

Steven D. Schwaitzberg, MD
Distinguished Professor and Chairman of Surgery

Weidun Alan Guo, MD, PhD
Clinical Professor of Surgery

20th Annual Department of Surgery Research Day
May 23rd, 2024

Jacobs School of Medicine & Biomedical Sciences

AGENDA

6:45am – 7:45am
Grand Rounds: Guest lecturer, Melina Vasiliou, MD, Associate Professor of Surgery at McGill University, Associate Chair for Education and the Adair family Chair in Surgical Education, MIS Fellowship Program Director

Topic: "The Next Big Thing in Healthcare Education (it's probably not what you think)"

8:00am – 9:00am
Poster Session & Breakfast
(2nd Floor atrium, outside of M&T Aud, Room 2120B)

9:05am – 10:45am
Oral Presentations #1-8
(M&T Aud, Room 2120B)

10:45am – 11:00am
Break

11:00am – 12:40pm
Oral Presentations #9-17
(2nd Floor M&T Aud, Room 2120B)

12:45pm – 2:00pm
Luncheon & Awards
(1st Floor, Active Learning Center)

Department of Surgery

Poster Presentations

Poster Presentations

Group 1 – Poster professor: Csaba Gajdos, MD

1. **"The clinical relevance of neuronal activity measured by ARC gene expression in breast cancer biology "**
   Gabrielle Yee MD MS, Kohei Chida MD PhD, Kazuaki Takabe MD PhD.

2. **"Is VEGFA a Critical Factor for Breast Cancer Prognosis? "**
   Pia Sharma, BS, Kohei Chida, MD, Kazuaki Takabe, MD, PhD

3. **"Which immune cell types are associated with pathological complete response after neoadjuvant chemotherapy in breast cancer？"**
   Kohei Chida, Nan An, Takeru Kayahara, Yu Fujiwara, Arya Mariam Roy, John M. L. Ebos, Kenichi Hakamada, Li Yan, Kazuaki Takabe

4. **"IL-1β's Role in Obesity-Driven Lung Cancer: Potential for Chemo-Immunoprevention"**
   Akhil Goud Pachimatla MD1, Sukumar Kalvapudi MD1, Yeshwanth Vedire MD1, RR Vethanayagam PhD, Santosh Patnaik MD PhD, Joseph Barbi PhD, Sai Yendamuri MD

5. **"Do Technology and Specificity of Information Enhance Quality of Tumor Board Meetings?"**
   Kwaku Bonsu, MA, Opuruiche Ibekwe MBBS DrPh., Carmelo Gaudioso MD Ph.D., Chukwumere Nwogu MD Ph.D.

6. **"Impact of Radiologists and Pathologists on Thoracic Multidisciplinary Cancer Conferences "**
   Nuuh Sidali BS1, Opuruiche Ibekwe, MBBS, DrPH2, Carmelo Gaudioso, MD, PhD2, Chukwumere Nwogu, MD, PhD

7. **"Evaluation of a Technology Enhanced Breast Multidisciplinary Cancer Conference (MCC)"**
   Quratulain Sabih, MD1; Opuruiche Ibekwe, MBBS, DrPH; Carmelo Gaudioso, MD, PhD; Kristopher M. Attwood, MA, PhD, MS; Ellis G. Levine, MD; Stephen B. Edge, MD; Chukwumere E. Nwogu, MD, PhD

8. **"Impact of Technology on Quality of Thoracic Multidisciplinary Cancer Conferences"**
   Opuruiche Ibekwe, MBBS, DrPH1; Carmelo Gaudioso, MD, PhD; Kristopher M. Attwood, MA, PhD, MS; Saraswati Pokharel, MD; Charles L. Roche, MD; Chukwumere E. Nwogu, MD, PhD

9. **"Technology enhanced Multidisciplinary Cancer Conferences in Gynecologic Oncology "**
   Amma F. Agyemang MD, PhD, Opuruiche Ibekwe, MBBS, DrPH, Carmelo Gaudioso MD, PhD, MBA, Kristopher M. Attwood, MA, PhD, MS, Sarah Werner, MD, Chukwumere Nwogu MD, PhD and Peter J. Frederick MD

10. **"Pre-clinical evaluation of an anti-survivin peptide vaccine to intercept lung cancer."**
    Akhil G. Pachimatla MD, Sukumar Kalvapudi, MD1, Kaylan Gee, MD1, Robert R. Swamidoss, PhD, Sheila Figel2, Robert Fenstermaker, MD, Michael Ciesielski, PhD, Sai Yendamuri MD, Santosh K. Patnaik, MD, PhD

11. **"Obesity-induced gene expression changes – role in lung cancer management"**
    Akhil Goud Pachimatla MD, Robert Zollo PhD, Sukumar Kalpavudi MD, Kaylan Gee MD, Robert Robin Swamidoss PhD, Randall J Smith Jr PhD, Joseph Barbi PhD, Sai Yendamuri MD, Santosh K. Patnaik MD PhD

Poster Presentations

Group 2 – Poster professor: Kazuaki Takabe, MD

12. **"The Impact of Preoperative Anemia on Long Term Survival, Amputation-free Survival, Limb Salvage in Patients with Chronic Limb Threatening Ischemia"**
Rose Gooding, Mariel Rivero, Brittany Montross, Sikandar Khan, Linda Harris, Maciej Dryjski, Hasan H. Dosluoglu

13. **"Bypass Despite Patent Endovascular Treated Arterial Segments In Patients with Tissue Loss"**
Matthew Chang, Ariel Prieto, Mariel Rivero, Brittany Montross, Sikandar Khan, Linda Harris, Maciej L Dryjski, Hasan H Dosluoglu

14. **"Incretin Medication Protects Against Heart Failure After Carotid Revascularization"**
Adam H. Abbas B.S., *Sharan I. Prasad B.S., Austin Knorz B.S., Sydney Pigott MPH, Peter Principe B.S., Hasan H. Dosluoglu M.D., Nader D. Nader MD, Ph.D.

15. **"Incretin medication and limb salvage after lower extremity revascularization."**
*Adam H. Abbas B.S., Peter Principe B.S., Allen Murphy, B.S., Sharan Prasad B.S., Sydney Pigott MPH, Hasan H. Dosluoglu M.D., Nader D. Nader M.D., Ph.D.

16. **"Same-Day Discharge following Pediatric Thyroidectomy or Thyroid Lobectomy is Increasing and Safe in Select Cases; A NSQIP-Pediatric Analysis"**
John M. Woodward, MD (Res), *Katherine Foote, MA, Stephanie Brierley, MD (Res), Krystle Bittner, MPH, Hector Osei, MD, Carroll Harmon, MD, PhD, P. Benson Ham III, MD, MS

17. **"Same-Day Discharge for Pediatric Nuss Procedure is Increasing Without Affecting Complication Rates; an Analysis of the NSQIP-Pediatric Database"**
John M. Woodward, MD (Res), *Ali Muhammad Khan, BS, Stephanie Brierley, MD (Res), Krystle Bittner, MPH, Hector Osei, MD, Carroll Harmon, MD, PhD, P. Benson Ham III, MD, MS

18. **"Same-Day Discharge for Elective Pediatric Laparoscopic Gastrostomy Tube Insertion is Safe and Increasing in Frequency; a NSQIP-Pediatric Retrospective Review 2017 to 2021"**
John M. Woodward, MD (Res), *Caitlin Chunco, BS, Stephanie Brierley, MD (Res), Krystle Bittner, MPH, Hector Osei, MD, Carroll Harmon, MD, PhD, P. Benson Ham III, MD, MS

19. **"Trends and Outcomes in Pediatric Laparoscopic Appendectomy: A NSQIP-P Analysis of Same-Day Discharge and Readmission Rates"**
   *John M. Woodward, MD (Res), Stephanie Brierley, MD (Res), Krystle Bittner, MPH, Katherine Foote, MA, Hector Osei, MD, Carroll Harmon, MD, PhD, P. Benson Ham III, MD, MS

20. **"Same-Day Discharge for Elective Pediatric Gastrostomy Closure has Improved Readmission and Reoperation Rates Compared to Non-Same-Day Discharge; A NSQIP-Pediatric Analysis"**
   John M. Woodward, MD (Res), *Rhys Mendel, BS, Stephanie Brierley, MD (Res), Krystle Bittner, MPH, Hector Osei, MD, Carroll Harmon, MD, PhD, P. Benson Ham III, MD, MS

21. **"National Practice Patterns of Same-Day Discharge for Pediatric Laparoscopic Cholecystectomy Utilizing NSQIP Pediatric Registry"**
   John M. Woodward, MD (Res), Stephanie Brierley, MD (Res), Krystle Bittner, MPH, *Katherine Foote, MA, Hector Osei, MD, Carroll Harmon, MD, PhD, P. Benson Ham III, MD, MS

22. **"Same-Day Discharge for Pediatric Pyloromyotomy May Slightly Increase Emergency Room Visits for Emesis without Impacting Other Complication Rates, Making Early Discharge Reasonable in Select Patients: A NSQIP-P Analysis"**
   John M. Woodward, MD (Res), *Michael LaRock, BS, Stephanie Brierley, MD (Res), Krystle Bittner, MPH, Hector Osei, MD, Carroll Harmon, MD, PhD, P. Benson Ham III, MD, MS

Poster Presentations

Group 3 – Poster professor: Carroll Harmon, MD

23. **"Dye-less Quantification of Tissue Perfusion by Laser Speckle Contrast Imaging Offers Equivalence to Clinically Validated Quantified Indocyanine Green in Porcine Model"**
Garrett C. Skinner, MD, Mikael Marois, PhD, John G. Oberlin, PhD, Christopher J. McCulloh, MD, Steven D. Schwaitzberg, MD, Peter C.W. Kim, MD, PhD

24. **"Real-time Near Infrared Artificial Intelligence using Scalable Non-Expert Crowdsourcing in Colorectal Surgery"**
Garrett C Skinner, MD, Tina Chen, Gabriel Jentis, Yao Z Liu, MD, Christopher J McCulloh, MD, Alan Harzman, MD, Emily Huang, MD, Matthew Kalady, MD, Peter CW Kim, MD PhD

25. **"Catastrophic Health Expenditures for Colorectal Cancer Care: A Retrospective Analysis of the First Private Comprehensive Cancer Center In Lagos, Nigeria"**
Frankie I. Uwechue MD; Norah N. Zaza MD; Matt Caputo BS; Zainab Adegbite MPH3; Chinenye Iwuji BM, PhD; Chukwumere Nwogu MD PhD; Bindiya Chugani BS; Kristina Diaz MSN, RN; Juliet S. Lumati MD, MPH

26. **"Surgical Chronicles: A Bibliometric Exploration of Healthcare Disparities in Scientific Publications over Five Decades"**
Degen Mariniello, BS; Joseph C L'Huillier, MD; Jinwei Hu, MD; Weidun A Guo, MD, PhD

27. **"The Forgotten Father of Modern Operative Surgery from the Islamic Golden Age: Abu al-Qasim Al Zahrawi and his Timeless Legacy"**
Muhammad Ali Awan, MD, Weidun Alan Guo, MD, PhD, FACS.

28. **"Higher Rates Of Colon Cancer In Delayed Appendectomy Patients "**
Adam H. Abbas B.S., *Rachel Lippman B.S., Anneliese Markus B.S., Csaba Gajdos M.D., Toni Ferrario M.D., Nader D. Nader M.D., Ph.D.

29. **"Cost of Cancer: The Effects of Pediatric Cancer on Financial Health of Caregivers."**
Maria Fayyaz, Kamryn Amici, Liam Clancy, Richard Lagutaine, Tessa Morris, Reshub Pendyala, Rene Bouchard, Elizabeth A. Gage-Bouchard, PhD

30. **"An Analysis of the Relationship Between Female Faculty and Female Resident Representation in Neurosurgery Residency Programs "**
Megan D. Malueg BS, Hayden E. Greene MD MS, Renée M. Reynolds MD

31. **"Barriers to Longitudinal Community Service in Medical Education"**
Cordero, Gaby, BS; Rafah, Sefati, BS; Lenyo, Julie MPH; L'Huillier, Joseph, MD; Bhinder, Jasmine, MD; Kelly III, William, MD; Lutfy, Jenna, BS; DiVasta, Alexandra, BS; Sanderson, Melinda, MBA; Lukan, James, MD; Lamb, Michael, PhD

32. **"The Validity of Frailty Scoring in Preoperative Risk Assessment for Patients in the Surgical Intensive Care Unit"**
Chloe McQuestion B.S, Madison Ballacchino B.S, Jason Gershgorn B.S, Csaba Gajdos M.D, Nader Nader M.D., Ph.D.

Poster Presentations Group 1

1. **The clinical relevance of neuronal activity measured by ARC gene expression in breast cancer biology**

Gabrielle Yee MD MS, Kohei Chida MD PhD, Kazuaki Takabe MD PhD.

University at Buffalo Jacobs School of Medicine, Roswell Park Comprehensive Cancer Institute

Background: Recently peritumoral lidocaine infiltration prior to removal was reported to be associated with better survival in early-stage breast cancer (BC). This led us to hypothesize that innervation to the tumor affects its biology and patient survival. Activity-regulated cytoskeleton-associated protein (ARC) gene expression is known to be regulated by neuronal activity. Therefore, we studied the clinical relevance of ARC gene expression as a surrogate of neuronal activity in breast cancer.

Methods: Sweden Cancerome Analysis Network—Breast (SCAN-B (GSE96058), n=3273) cohort was analyzed, and the results were validated using The Cancer Genome Atlas (TCGA, n=1069).

Results: ER-positive/HER2-negative and Luminal A type cancers expressed significantly higher ARC compared to the other subtypes in both cohorts ($p<0.005$). In the tumor microenvironment, the stromal cells such as fibroblasts, endothelial cells and adipocytes were all found to be significantly infiltrated in high ARC BC ($p<0.01$). Multiple immune cells were significantly infiltrated in high ARC BC, including CD8, CD4 memory cells, helper type II T cells, regulatory T cells, M1 and M2 macrophages, dendritic cells and B cells (all $p<0.03$ in both cohorts). In terms of cancer characteristics, there was no difference in silent or nonsilent mutations, single nucleotide variant or indel neoantigens between tumors with low or high ARC expression. However, high ARC BC was significantly associated with less homologous recombination deficiency, intratumor heterogeneity and fraction altered mutation rate compared to low ARC BC in TCGA ($p<0.001$). High ARC expression was significantly associated with smaller tumor size ($p<0.001$) and without lymph node metastasis in the SCAN-B cohort ($p<0.02$), and less Stage IV disease in the TCGA cohort ($p<0.02$); however, these results were not validated by the other. High ARC BC was significantly associated with lower Nottingham histologic grade and lower MKi67 expression in both SCAN-B and TCGA cohorts ($p<0.001$). Cell proliferation-related gene sets in the Hallmark collection (E2F targets, G2M checkpoint, and MTORC1 signaling) were significantly less enriched to high ARC BC consistently in both cohorts. Overall survival (OS) was significantly better in high ARC BC in the ER-positive/HER2-negative subtype consistently in both cohorts ($p<0.01$), and when including all subtypes in the SCAN-B cohort ($p<0.001$); however, this was not validated in TCGA. No significant difference in OS was found between low and high ARC gene expression in triple negative breast cancers in either cohort.

Conclusion: ARC gene expression as a surrogate of neuronal activity in breast cancer was associated with high infiltration of stromal cells and immune cells, but with less cancer cell proliferation and better overall survival, particularly in the ER-positive/HER2-negative subtype. Future studies are warranted to investigate the exact molecular mechanism underlying the effects of ARC.

2. Is VEGFA a Critical Factor for Breast Cancer Prognosis?

Pia Sharma, BS, Kohei Chida, MD, Kazuaki Takabe, MD, PhD

Department of Surgical Oncology, Roswell Park Comprehensive Cancer Center

Background: Vascular endothelial growth factor-A (*VEGFA*) is a well-known factor that induces angiogenesis, one of the hallmarks of cancer, which generates new blood vessels in the tumor microenvironment (TME) and provides conduit for cancer to metastasize. Interestingly, an anti-*VEGFA* drug (Avastin) failed to show benefit in clinical trials for breast cancer (BC). In this study we investigated the clinical relevance of *VEGFA* gene expression in BC.

Methods: A total of 7336 BC patients from eight independent cohorts, TCGA (*n*= 1073), METABRIC (*n*= 1903), SCAN-B (GSE96058, *n*= 3069), MAQC-II (GSE20194, *n*=278), Ronde et al. (GSE34138, *n*=178), Chen et al. (GSE163882, *n*=222), Hatzis et al. (GSE25066, *n*=508), and ISPY2 (GSE173839, *n*= 105) were analyzed. These cohorts were divided into high and low *VEGFA* gene expression groups using the median.

Results: High *VEGFA* expression in BC was associated with worse overall survival in SCAN-B cohort which was validated in METABRIC cohort with overall, disease-specific, and disease-free survival (all p<0.02). *VEGFA* expression was higher in triple negative BC (TNBC) but was lower in BC with lymph node metastasis. High *VEGFA* BC was associated with significantly high intratumoral heterogeneity, homologous recombination defect, silent and non-silent mutations, and SNV neoantigens in TCGA, and was also associated with higher cell proliferation, evidenced by higher Nottingham histological grade, higher Ki67 gene expression, and enrichment of all the Hallmark cell proliferation-related gene sets: Mitotic spindle, G2M Checkpoint, E2F Targets, MYC Targets v1 and v2, and mTorC1 signaling, consistently, in SCAN-B, METABRIC, and TCGA cohorts. Reflecting its enhanced growth, high *VEGFA* expression was associated with less infiltration of fibroblasts and adipocytes (all p<0.05). Surprisingly, *VEGFA* expression did not enrich angiogenesis gene set in any of the cohorts, nor was related with infiltrations of blood or lymphatic vascular endothelial cells, besides pericytes. But high *VEGFA* BC was associated with significantly less infiltrations of anti-cancer immune cells; CD8, CD4, and dendritic cells were all significantly less, and T helper type 1 cells and regulatory T cells were significantly higher consistently in SCAN-B, METABRIC, and TCGA cohorts. *VEGFA* expression was significantly higher in BC that achieved pathological complete response after Anthracycline and Taxane based neoadjuvant therapy in both ER+/HER2- and TNBC subtypes in the Hatzis et al. cohort, and after immunotherapy in ER+/HER2- subtype, but not TNBC, in the ISPY2 clinical trial cohort. This was not validated in MAQC-II, Ronde et al., or Chen et al. cohorts.

Conclusion: Our research indicates that high *VEGFA* BC is associated with high cell proliferation, less immune cell infiltration, and worse survival, but better response to Anthracycline and Taxane based chemotherapy, and immunotherapy.

3. Which immune cell types are associated with pathological complete response after neoadjuvant chemotherapy in breast cancer?

Kohei Chida, Nan An, Takeru Kayahara, Yu Fujiwara, Arya Mariam Roy, John M. L. Ebos, Kenichi Hakamada, Li Yan, Kazuaki Takabe

Department of Surgical Oncology, Roswell Park Comprehensive Cancer Center

Background: Tumor-infiltrating lymphocytes (TILs) are known as a surrogate for the response to neoadjuvant chemotherapy (NAC) in breast cancer (BC); however, reports on the infiltration of specific immune cell types have been limited to small cohorts. Here we investigated the infiltration of immune cell type that is associated with pathological complete response (pCR).

Methods: We analyzed transcriptome of 2,392 pre-treatment BC from 18 independent cohorts treated with anthracycline-based NAC. CYBERSORT was used to estimate the type and number of infiltrated cells within the bulk tumor. Odds ratios (ORs) were calculated and pooled using fixed-effect model meta-analysis to assess the association between pCR and immune cell types.

Results: B cells [OR=6.0, 95% confidence interval (CI): 2.5-14.6, I^2=0%], plasma cells [6.2, 2.4-15.6, I^2=10%], activated dendritic cells (DCs) [91.6, 3.2-2.7×10^3, I^2=25%], M1 macrophages [620, 71-5.4×10^3, I^2=43%], and follicular T cells [54.3, 7.2-408.9, I^2=16%] were associated with pCR ($p<0.05$). In contrast, regulatory T cells [0.01, 0-0.10, I^2=0%] and monocytes [0.00, 0-0.05, I^2=16%] were associated with residual disease ($p<0.05$). Analysis on BC subtype found that B cells [9.6, 1.1-92.0, I^2=0%], plasma cells [16.0, 1.7-153.5, I^2=0%] and M1 macrophages [4.1×10^4, 87.5-1.9×10^7, I^2=17%] were associated with pCR in the ER+/HER2- subtype, while follicular T cells [1.3×10^3, 9.0-2.0×10^4 I^2=0%] were associated with pCR in triple negative BC ($p<0.05$). Notably, pCR was not associated with CD4 or CD8 T cells among all subtypes.

Conclusions: Infiltration of B cells, plasma cells, activated DCs, M1 macrophages, and follicular T cells were significantly associated with pCR after anthracycline-based NAC in BC patients.

Presenter: Kohei Chida, Postdoctoral fellow
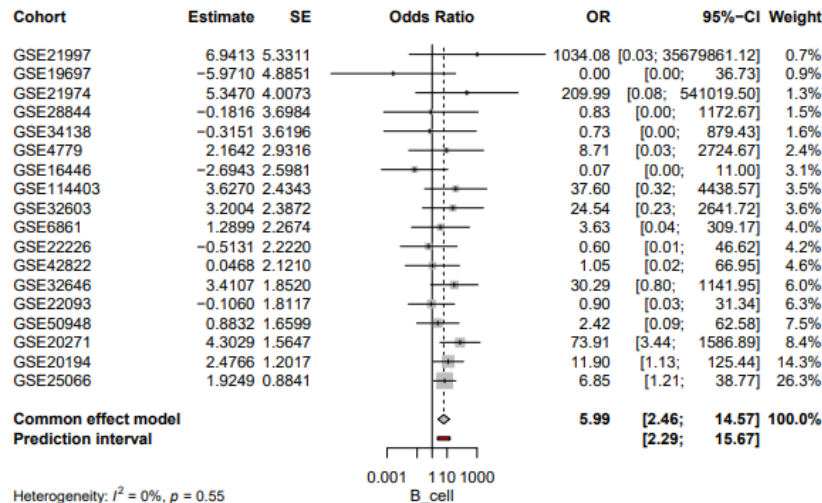
Forrest plot showing that B cell infiltration was associated with pathological complete response after neoadjuvant chemotherapy in breast cancer patients.

4. IL-1β's Role in Obesity-Driven Lung Cancer: Potential for Chemo-Immunoprevention

Akhil Goud Pachimatla MD, Sukumar Kalvapudi MD, Yeshwanth Vedire MD, RR Vethanayagam PhD, Santosh Patnaik MD PhD, Joseph Barbi PhD, Sai Yendamuri MD

Department of Thoracic Surgery and Immunology, Roswell Park Comprehensive Cancer Center, Elm and Carlton Streets, Buffalo, NY 14263, USA.

Introduction: Increased risk of lung cancer in obese patients is hypothesized to be due to sustained inflammatory response in adipose tissue. Canakinumab Anti-inflammatory Thrombosis Outcome Study (CANTOS) trial showed reduced risk of lung cancer and improved survival. Follow-up trials using Canakinumab failed to show similar results. As Obesity increases inflammation predisposing to carcinogenesis, we sought to assess the effect of IL-1β blockage in lung cancer with and without obesity.

Methods: To examine cancer initiation, carcinogenesis was induced by injecting Urethane in mice with high-fat diet-induced obesity and in age-matched control mice. Mice were treated with either anti-IL-1β IgG or control IgG in twice-weekly doses for 30 weeks. Later, we harvested the lungs, and the tumor burden was measured histologically as tumor lung area fraction.

To examine cancer progression, young male mice were subcutaneously inoculated with Lewis lung carcinoma (LLC) cells to induce tumors, followed by anti-IL-1β IgG or control IgG. Then, we monitored tumor growth by measuring daily tumor size and final tumor weight to compare between the groups.

Results: Obesity was associated with inflammation in mice as seen from increased plasma CRP levels (mean 19.07 vs. 14.31 ng/ml; t-test p=0.003; fig.1A). Carcinogenesis was 2.6x higher in obese mice (p=0.009). Treatment with anti-IL-1β compared to control antibody reduced carcinogenesis in obese (mean 6.3% vs. 1.8% lung area, p=0.03) but not non-obese mice (0.6% vs. 0.7%, p=0.3) (fig.1B). Though obese mice grew larger subcutaneous tumors, IL-1β blockage did not affect tumor growth obese or normal weight groups.

Conclusion: Our findings support further studies of IL-1β antagonism as a chemo-immunoprevention strategy for lung cancer. The obesity-dependent reduction in carcinogenesis suggests a population that can be targeted for clinical translation of these findings. Consistent with clinical trials, a therapeutic effect of IL-1β blocking was not observed for mouse lung cancer.
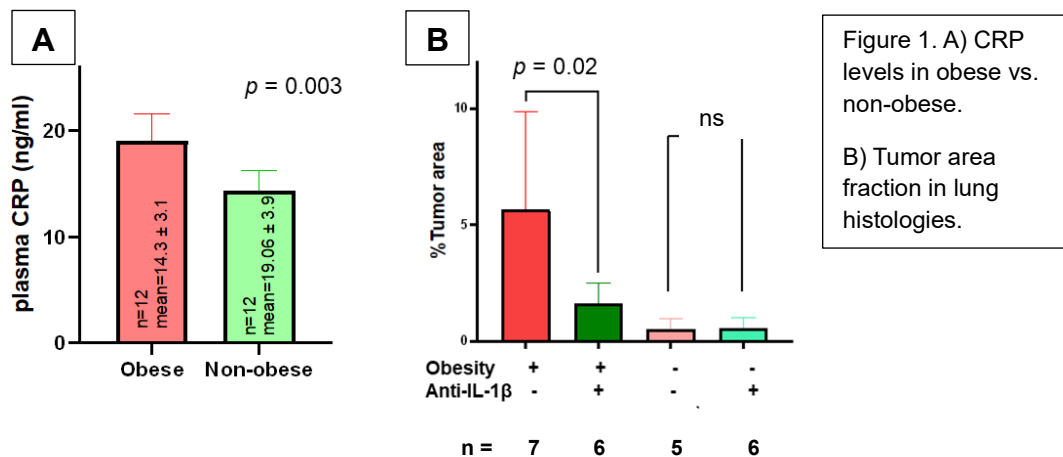
Figure 1. A) CRP levels in obese vs. non-obese.

B) Tumor area fraction in lung histologies.

5. Do Technology and Specificity of Information Enhance Quality of Tumor Board Meetings?

Kwaku Bonsu, MA, Opuruiche Ibekwe MBBS DrPh., Carmelo Gaudioso MD Ph.D., Chukwumere Nwogu MD Ph.D.

Thoracic Surgery Department, Roswell Park Comprehensive Cancer Center

Background: Cancer management is complex and multidisciplinary approaches lead to better patient outcomes and quality of care. The aim of our study was to assess the impact of technology on the provision/specificity of information and their impact on the quality of tumor board meetings.

Methods: A review of 412 thoracic cancer patients presented at thoracic multidisciplinary cancer conferences (MCC) at an academic cancer center from September 2020 to December 2021 was performed pre and post introduction of the Navify® tumor board platform. We studied the impact of the provision and specificity of "reason for presentation" (RFP) and "new clinical problem" (NCP) on discussion time, quality of case presentation and arrival at consensus. A composite score was used to measure the quality of tumor board deliberations.

Results: The use of the technological platform resulted in an improved provision and specificity of NCP and RFP (Table 1). The quality of case presentation and discussion was improved when both NCP and RFP were provided compared to when they were not (mean composite score = 83.4 vs 78.0, p value=0.021), but there was no difference when NCP and RFP were specific (mean composite score = 83.7 vs 82.4, p value=0.383). However, the provision of these variables had no impact on discussion time and consensus.

Table 1: Impact of Tumor Board Platform on NCP and RFP

		Pre	Post	P-value
NCP Provided	Yes	122 (78.7%)	172 (97.2%)	<.001
NCP Specific	Yes	99 (63.9%)	160 (90.4%)	<.001
RFP Provided	Yes	125 (80.6%)	165 (93.2%)	0.002
RFP Specific	Yes	61 (39.4%)	74 (41.8%)	0.002

Conclusions: The use of a tumor board platform improved the provision and specificity of information. The provision of NCP and RFP enhanced the overall quality of deliberations. Additional benefits of technology on the conduct and quality of tumor board meetings deserve further study.

6. Impact of Radiologists and Pathologists on Thoracic Multidisciplinary Cancer Conferences

Nuuh Sidali BS, Opuruiche Ibekwe, MBBS, DrPH, Carmelo Gaudioso, MD, PhD, Chukwumere Nwogu, MD, PhD

Jacobs School of Medicine and Biomedical Sciences
Roswell Park Comprehensive Cancer Ceneter, Department of Thoracic Surgery

Background: Lung cancer remains the leading cause of cancer death in the U.S and globally; surpassing breast, colon and prostate cancer combined. Despite improvements in lung cancer treatments, survival of patients with advanced stages remains low. Multidisciplinary Cancer Conferences (MCCs), forums for discussing cancer cases, have been shown to improve survival. MCC participants include medical, surgical and radiation oncologists, pathologists, radiologists, and other healthcare professionals that collaborate to formulate diagnostic and treatment plans. Access to accurate, complete, and relevant information is critical to effective case discussions. This study explored the roles and impact of radiologists/pathologists and technology on the work of thoracic MCCs. Understanding their role in MCCs and improving their contribution to case discussion and treatment planning should result in improved quality of care and patient outcomes.

Methods: We conducted semi-structured interviews and observational study. The subjects included three radiologists/three pathologists who participated in the Thoracic MCCs at Roswell Park Comprehensive Cancer Center. Using narrative analysis of the interview records, we explored their views on Thoracic MCCs. We utilized observational data of the same Thoracic MCCs collected prospectively before and after introduction of NAVIFY® Tumor Board Solution using a validated performance assessment tool.

Results: A narrative analysis of interview transcripts revealed that pathologists leverage clinical and morphologic/molecular information to provide diagnostic and prognostic insights which guide treatment decisions. Radiologists help with differential diagnoses and planning of radiation or surgical treatment. Technology can extend the benefits of MCCs to underserved communities. Additionally, AI-driven technology may optimize preparation/presentation of cases at MCCs by accessing digitalized patient records. Overtime, MCCs refine radiologists'/pathologists' insights into clinical care planning. The observational data showed an increase in the quality of presentation by radiologists/pathologists post-NAVIFY (pre vs post mean scores: 3.5 vs 4.8; $p<.001$ and 3.2 vs 4.4; $p<.001$, respectively). Radiologists' participation in case discussions increased (pre vs post: 8.5% vs 19.2%; $p<.020$).

Conclusion: Radiologists/pathologists provide impactful insights into care planning at MCCs. AI technology can be leveraged to further increase the efficiency of MCCs. Technology can extend the benefits of MCCs to underserved populations.

7. Evaluation of a Technology Enhanced Breast Multidisciplinary Cancer Conference (MCC)

Quratulain Sabih, MD; Opuruiche Ibekwe, MBBS, DrPH; Carmelo Gaudioso, MD, PhD; Kristopher M. Attwood, MA, PhD, MS; Ellis G. Levine, MD; Stephen B. Edge, MD; Chukwumere E. Nwogu, MD, PhD

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Background: Tumor board meetings have been a standard approach for managing complex cases. In 2020, a digital platform, navify® Tumor Board Solution (NTBS), was implemented at a comprehensive academic cancer center. The objectives of this study were to assess the impact of NTBS (1) on quality of patient information and case deliberation, (2) rate of change in care plans by the MCC, (3) compliance of care plans with national guidelines, and (4) concordance of treatment received with MCC recommendations.

Methods: We conducted a prospective study from September 2020 to February 2022, before and after implementation of NTBS. We used a validated tool, "Metric for the Observation of Decision-Making", to assess the impact of the platform on the quality of breast MCC case presentation and discussion. We reviewed medical records to compare the rate of change in care plans, compliance with national guidelines, and concordance of treatment received with MCC recommendations.

Results: There were 39 and 47 patient cases in the pre- and post-NTBS groups, respectively. We found that implementation of technology led to an improvement in the overall quality of the MCCs (mean composite scores: 56.4 vs 67.5; $p<.001$). Specific components that were significantly improved include case history, reason for presentation, radiology and pathology presentations, and medical oncology contribution to case discussions (mean scores: 3.4 vs 3.9; $p<.001$, 3.3 vs 3.9; $p<.001$, 2.7 vs 4.1; $p<.001$, 3.1 vs 4.2; $p<.001$ & 3.7 vs 4.1; $p=.05$). Pre- vs post-NTBS, rate of change in care plans decreased from 57.1% to 51.1%, compliance of MCC care plans with NCCN guidelines increased from 80.0% to 81.4%, and concordance of treatment received with MCC recommendations increased from 83.9% to 86.5%, though they were not statistically significant.

Conclusion: Technology increases the quality of patient information presentation and case discussion at Breast MCCs, but in this small study we did not demonstrate an impact on MCC decision making. Areas for further development include assessment of improved efficiency of MCCs, opportunities for asynchronous MCC evaluation using this platform, establishment of automated case summaries, and technology-driven matching of detailed patient characteristics to established national guidelines.

Keywords:

Breast cancer, multidisciplinary tumor board, quality control measure, improved compliance with NCCN guidelines.

8. Impact of Technology on Quality of Thoracic Multidisciplinary Cancer Conferences

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Background: Complex cancer cases require discussion at Multidisciplinary Cancer Conferences (MCCs) to determine the best management. The study aim was to assess the impact of navify® tumor board solution (NTBS) technology on the quality of information presented, case discussions, and care plans at thoracic MCCs.

Methods: Between September 2020 and February 2022, using a before-after study design, we prospectively collected data through direct observation of thoracic MCCs at an academic cancer center. The NTBS technology was introduced in March of 2021. Additionally, we reviewed medical records to assess several factors including the rate of change in care plans as decided by the MCC, compliance of all care plans with national guidelines, and concordance of treatment received with MCC recommendations. Observational data was collected via a validated tool "Metric for the Observation of Decision-Making". We used SAS v9.4 (Cary, NC) for statistical analyses.

Results: We identified 151 and 166 thoracic cancer cases before and after implementation of NTBS, respectively. The overall quality of case presentation and discussion, represented by a mean composite score (the summation of individual variables scored on a 1-5 scale, poor to excellent), increased from 56.8 to 82.0 (p<.001). This improvement was also observed across multiple sub-components of the composite score including case history (3.4 vs 4.6), reason for presentation (3.2 vs 4.6), comorbidities/performance status/psychosocial information (2.8 vs 4.2), patient views (1.2 vs 3.3), radiology and pathology presentations (3.5 vs 4.8 and 3.2 vs 4.4, respectively), and contribution from surgical, medical, and radiation oncologists (3.9 vs 4.3, 3.3 vs 3.8, and 3.5 vs 3.8, respectively), as well as the moderation by the MCC chair (4.9 vs 5.0). All these results were statistically significant with p<.001. There was no statistically significant difference between the two cohorts in rate of change in care plans by the MCC, care plan compliance with national guidelines, and concordance of treatment received with MCC recommendations.

Conclusion: Technology improves the quality of information and discussion at tumor boards. However, this study did not demonstrate an impact on compliance with practice guidelines. Practitioners should explore the available tumor board technology platforms to optimize the conduct of MCCs in their respective institutions.

9. Technology enhanced Multidisciplinary Cancer Conferences in Gynecologic Oncology

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Background: Multidisciplinary Cancer Conferences (MCCs) improve quality of care and patient outcomes. The goals of our study were to investigate the impact of an information technology platform, navify® Tumor Board Solution (NTBS) on the (1) efficiency of preparing and conducting MCCs and (2) educational quality of the gynecologic oncology MCCs.

Methods: We conducted a prospective, mixed methods study (observation and survey) involving participants of the biweekly gynecologic oncology MCC at a comprehensive cancer center from 2020 to 2023. NTBS was introduced to the gynecologic oncology MCC for the preparation and presentation of tumor board cases. Data were collected before and after the introduction of NTBS. We used a validated observational tool to assess the impact of the platform on the quality of case presentation and discussion, as well as decision making (as measured by a composite mean score). We also evaluated compliance of care plans with national guidelines, changes in care plans, and concordance of actual treatment received with MCC recommendations. The survey consisted of five qualitative and two demographic questions. Interviews lasting 10 minutes were recorded using Microsoft Teams. Analyses were conducted using SAS v9.4 (Cary, NC) and Dedoose v9.0.17, (Los Angeles, CA).

Results: Pre- and Post-NTBS cohorts consisted of 49 and 60 patients, respectively. When comparing pre- versus post-NTBS cohorts, there was a difference in the mean composite score (50.57 vs 54.11; p=0.016). While there was no statistical difference between cohorts, patient care plans were changed in 13% of the cases and were 92% concordant with treatment received. Additionally, MCC recommendations were 100% compliant with national guidelines. Surveys of 13 MCC participants revealed that post-NTBS, the presentation format was more cohesive, concise, and structured. Common themes from gynecologic oncology fellows' responses included improvement of case preparation time and simplified process while using NTBS. However, trainees reported limited use of NTBS features, difficulty incorporating graphical data, and lack of a comprehensive list of NCCN guidelines. All respondents had educational goals for their participation and reported a high educational value of the MCC. These goals included knowledge acquisition of clinical diagnosis, management of standard of care versus complex situations, sentinel clinical trials underlying NCCN treatment guidelines, primary literature, management of preparation time and flow of discussion, and preparation for oral boards.

Conclusions: NTBS contributed positively to the gynecologic oncology MCC and clinical care for patients. Overall, NTBS had a positive impact on case formatting, preparation time and quality of trainee education. Comprehensive user training in the NTBS features could further enhance its utilization within the MCC.

10. Pre-clinical evaluation of an anti-survivin peptide vaccine to intercept lung cancer.

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Introduction: There is no preventive agent to reduce the likelihood of lung cancer development in high-risk populations. We are examining if immunization with a vaccine that targets a cancer cell-specific protein with a known pro-cancer role (survivin) can be such an agent.

Methods: NIH Gene Expression Omnibus was explored to assess suitability of survivin as an immunization target for lung cancer prevention. Using four mouse models of lung cancer, we are examining efficacy of the SurVaxM vaccine (4 weekly intradermal injections followed by monthly boosters) at reducing lung cancer development or progression. SurVaxM is an FDA fast-tracked vaccine that is in use for glioblastoma. SurVaxM is a Keyhole limpet hemagglutinin (KLH) conjugate of a 15 amino-acid survivin peptide (identical human and mouse sequences) that is administered as a formulation with adjuvants Montanide ISA 51G and granulocyte-macrophage colony-stimulating factor (GMCSF).

Results: Among current or former smokers, dysplasia of the airway epithelium was associated with higher survivin (BIRC5) gene expression (fig. A), and the gene's expression was significantly increased in urethane-induced mouse lung cancer tumors compared to adjacent normal lung (fig. B). Young male C57BL/6 mice that received the vaccine had a robust humoral IgG response against SurVaxM compared to saline-injected controls (fig. C). Experiments with male and female mice are underway to test the vaccine's cancer interceptiveness in urethane and oncogenic Kras-mediated carcinogenesis, and syngeneic subcutaneous (e.g., fig D) and orthotopic cell-line tumor progression models.

Conclusion: Our ongoing pre-clinical studies are assessing the suitability of SurVaxM for human trials for lung cancer prevention. This vaccine, with demonstrable efficacy in human glioblastoma without significant side effects, is one of the few candidate agents that hold promise for intercepting lung cancer.
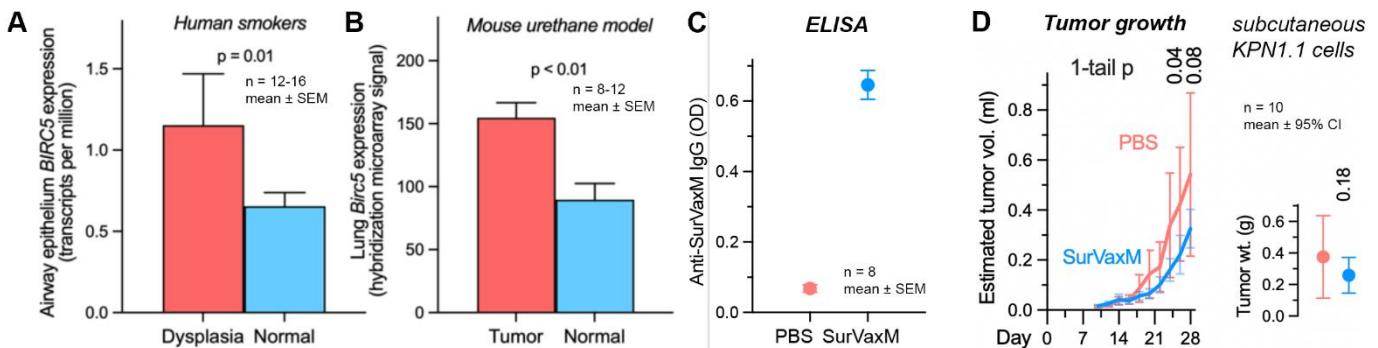
11. Obesity-induced gene expression changes – role in lung cancer management

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Introduction: Obesity is a risk factor for multiple cancers. We have previously observed that increased body fat in lung cancer patients is associated with greater recurrence risk and shorter survival. While the influence of obesity on anti-cancer immunity and tumor microenvironment has been described, the effects on cancer cells themselves still remains unclear. We therefore characterized the genome level changes by methylation and transcriptome profiling in mouse lung cancer cells.

Methods: We subcutaneously inoculated KPN1.1 or LLC-Luc mouse lung cancer cells in young male C57BL/6 mice with or without diet-induced obesity. From the developed tumors, we sorted cancer cells (live EpCAM$^+$CD45$^-$) using flow cytometry. Genome methylation and transcriptome profiling of the cells were then performed on Infinium Epic v2 Bead Chip microarray and Illumina TruSeq RNA sequencing platforms.

Results: KPN1.1 and LLC-Luc tumors respectively grew to be 5.0 and 1.5 times larger on average in obese compared to non-obese mice (t-test p = 0.002 and 0.011; fig. 1A). In tumor cancer cells, expression of 353 genes (2.3% of transcriptome) was similarly affected by obesity in both carcinomas. These genes over-represented important elements of cancer biology, such as angiogenesis, cell proliferation, and extracellular matrix (fig. B). The methylation of 550 genes, including those involved in epithelial cell migration and proliferation (fig. C), was identically affected by obesity in both tumor cell lines.

Conclusion: The widespread and direct effects of obesity on cancer cells that we observe, including epigenetic ones, may be responsible for worse patient outcomes. Our study recognizes the biological changes induced by obesity itself as well as cellular pathways that are dysregulated. By targeting these pathways clinicians and researchers may find new avenues to mitigate the detrimental effects of obesity in malignancy.

Figure legend.

Obesity promotes tumors through widespread effect on cancer cells. A. Growth of two lung carcinomas after subcutaneous injection in male mice ± obesity. Volumes are estimated from manual caliper measurements. *B, C.* Gene pathways (GO:BP database) were identified as significantly affected by obesity in cancer cells of both carcinomas by over-representation analyses of the transcriptome (*B*) and genome methylation (*C*) data.
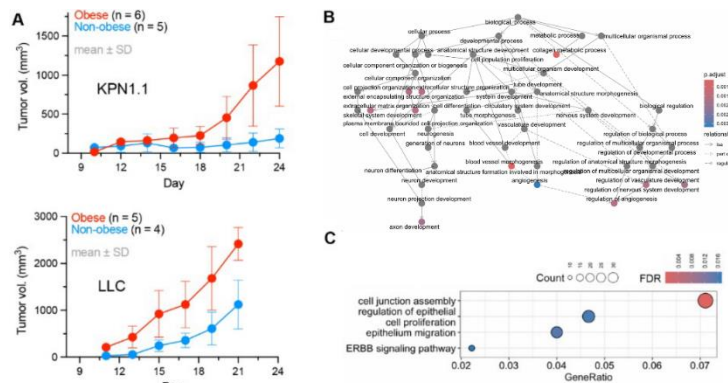
Poster Presentations Group 2

12. The Impact of Preoperative Anemia on Long Term Survival, Amputation-free Survival, Limb Salvage in Patients with Chronic Limb Threatening Ischemia

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Background: Preoperative anemia is common in patients with chronic limb threatening ischemia (CLTI) and hematocrit being <30 was found to be associated with decreased one-year amputation-free survival (AFS) in PREVENT III, but was not adopted for risk assessment. Recently, worse one-year AFS and limb salvage (LS) was reported following vascular surgery for PAD with moderate/severe anemia. Goal of our study was to assess the impact of anemia on early and long-term survival, AFS, LS and patency rates in patients undergoing revascularization for CLTI.

Methods: Patients with CLTI who had revascularization for Rutherford 4-6 between 1/2007-12/2021 were included. Patients with preoperative Hct ≥39 (Group I, N=275 (335 limbs)) were compared to those with mild anemia (Hct 33.0-38.9, Group II, 266 (338 limbs)) and moderate/severe anemia (Hct <33.0, Group III, N=199 (266 limbs)). As only 15% of patients had Hct<30, we used the WHO classification for anemia.

Results: Patients in Group I were younger (70.4 ± 9.9 vs. 73.1 ± 9.7 vs. 72.9 ± 10.9, P<0.01) with less hypertension (74% vs. 83% vs. 84%, P=0.006), DM (50% vs. 67% vs. 69%, P<0.001), CKD (21% vs. 42% vs. 52%, P<0.001), non-ambulatory (8% vs. 21% vs. 26%), and higher active smoking (47% vs. 23% vs. 25%, P<0.001) than Group II and III. There were more patients with tissue loss (70% vs. 85% vs. 92%, P<0.001), infrapopliteal interventions (46% vs. 56% vs. 65%), and underwent endovascular interventions (61% vs, 78% vs. 84%, P<0.001) in Groups II and III than Group I. Postoperative 30-day mortality/MI were significantly more in Group II and III (1.4% vs. 6.0% vs. 4.0%, P=0.013). Overall survival (5-year $52\pm3\%$ vs. $30\pm3\%$ vs. $22\pm3\%$, P<0.001), AFS (5-year $47\pm3\%$ vs. $25\pm3\%$ vs. $16\pm3\%$, P<0.001) were significantly different in groups. Multivariate analysis showed CAD (HR 1.4 (95% CI 1.1-1.6)) , CKD (1.5 (1.2-1.8), nonambulatory status (1.7 (1.3-2.1)), tissue loss (1.5 (1.2-2.0)), and Hct <39 (Group II 1.4 (1.2-1.8), Group III 1.8 (1.4-2.2)) to be independently associated with survival and AFS (all P<0.001). LS rates were similar after open revascularization (P=0.737) however, was significantly different in patients who had endovascular revascularization (5-year $90\pm2\%$ vs. $83\pm3\%$. vs. $75\pm4\%$, P=0.002). Primary patency was similar in all Groups (5-year PP $58\pm4\%$ vs. $58\pm4\%$ vs. $63\pm4\%$, P=0.973)

Conclusion: Preoperative anemia (Hct<39) is associated with poorer early postoperative events and independently associated with late survival and AFS in patients with CLTI after revascularization. LS seem to be impacted by the level of anemia in patients treated with endovascular interventions, and not after open revascularization.

13. Bypass Despite Patent Endovascular Treated Arterial Segments In Patients with Tissue Loss

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Background: Limb loss despite patent bypass is a well-reported entity. Our group previously reported amputation despite patent endovascular treated arterial segment (PETAS) is the most common means of limb loss in patients undergoing endovascular intervention (EVI) for CLTI. We have performed tibial/pedal bypasses in patients who are clinically failing despite PETAS to prevent limb loss. The goal of our study was to define this subgroup and analyze the outcomes.

Methods: All patients who underwent initial infrainguinal EVI for CLTI (Rutherford 5-6) between 7/2007-12/2022 were screened. Patients who underwent tibial/pedal bypass despite PETAS for limb salvage were reviewed.

Results: EVI was performed in 551 patients (665 limbs, age 73.2±9.8(48-98), ulcer 77.9%, gangrene 22.1%, mean follow-up of 33.7 months (0-177)) 5-year limb salvage was 82±2%, survival was 26±2%. Eighty-nine patients had amputation, 78 (87.6%) despite PETAS or bypass graft. Of the 58 (8.7% of all limbs) patients who had bypass during follow-up (1 had two, two had 3 bypasses), 19 patients (20 limbs, 34.5% of bypasses) had bypass despite PETAS (12 DP, 3 distal AT, 5 PT; 17 with GSV, 2 cryopreserved veins, one composite PTFE/GSV) 2.1±1.4 months (0.5-5.0) after EVI. Seven had endovascular reinterventions before bypass. Morbidities included DM (90%), CKD/ESRD (45%/30%). ABI was noncompressible/falsely elevated in 80%. The EVI (75% infrapopliteal) resulted in direct/indirect angiosome-specific revascularization each in half of the patients. Multiple vessels were treated in 30%; GLASS inframalleolar descriptors were P0 in 30% and P1 in 70%. The target arterial path (TAP) was the same as the EVI in 10 and different in the remaining 10 limbs. Mean follow-up was 48±45 months (2-165) after bypass. Eleven patients died during follow-up and 5 (25%) had amputation at 3, 32, 38, 86 and 132 months; 3 with patent bypass (36, 38, 83 months) and 2 due to graft occlusion (1 and 32 months). Five required additional endovascular reinterventions.

Conclusions: Bypass despite PETAS can improve pedal perfusion due to either the increased flow lumen of bypass when compared to an endovascularly treated segment or by providing angiosome-specific revascularization in those with indirect revascularization after EVI, and can therefore achieve limb salvage in patients who are likely to lose their limbs despite PETAS. Tibial/pedal bypass should be considered when patients clinically regress despite angiographically patent ev-treated arteries.

14. Incretin Medication Protects Against Heart Failure After Carotid Revascularization

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Background: Chronic myocardial ischemia resulting from coronary artery disease is the primary contributor to heart failure (HF). Consequently, individuals undergoing carotid revascularization face an elevated susceptibility to acute coronary events, potentially culminating in congestive heart failure or mortality. Medications within the incretin mimetic class demonstrate a propensity to mitigate cardiovascular complications in diabetic patients. Our investigation endeavors to elucidate the impact of incretin therapy on enhancing cardiovascular outcomes post-carotid revascularization.

Methods: The TriNetX database was queried for patients who underwent carotid surgeries. The outcome variables studied were all-cause death (primary) and HF (secondary) within ten years after revascularization. Outcomes were compared between patients not on incretin medication (Cohort 1) before vascular surgery and patients taking these medications (Cohort 2). Univariate analysis was performed before and after propensity score matching for age, gender, BMI, endocrine/metabolic disease, COPD, use of medications (statin, metformin, insulin), and HbA1c % in the blood stratified by normal, prediabetic, and diabetic status. Odds ratios (OR) are provided with 95% confidence intervals (CI).

Results: A total of 3,204 (54%) men and 2,771 (46%) women underwent carotid artery revascularization. The average age of patients was 68 ± 8.7 and 68 ± 8.4 years old in cohorts 1 and 2 respectively. Mortality rates were lower in patients receiving incretins 333 (11.1%) vs. 519 (17.4%); OR=0.60; 0.51-0.69, p<0.001). The frequency of HF 337 (15.8%) in Cohort-2 was lower than 491 (23.0%) in Cohort-1 (OR=0.63; 0.54-0.73, p<0.001). When stratifying for type of heart failure, this trend in cardioprotection was sustained in both HFrEF (OR= 0.67; 0.55-0.82,P<0.001) and HFpEF (OR= 0.66;0.55-0.79,P<0.001). Primary outcome is summarized in Table 1.

	Odds Ratio	95% CI	p-value
Mortality	0.60	0.51-0.69	< 0.001
Heart Failure	0.63	0.54-0.73	< 0.001
HFpEF	0.67	0.55-0.82	< 0.001
HFrEF	0.66	0.55-0.79	< 0.001

Table 1. Risk Analysis of mortality and heart failure between patients trated with carotid revascularization and un-treated groups. **HFpEF** = Heart Failure with Preserved Ejection Fraction, **HFrEF** = Heart Failure with Reduced Ejection Fraction

Conclusion: The risk of HF and all-cause death is lower in patients taking incretins after carotid revascularization. Future studies should investigate the treatment length of medication and how time under treatment may impact outcomes.

15. Incretin medication and limb salvage after lower extremity revascularization.

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Background: Critical limb ischemia, a condition most common among diabetics, is caused by arterial insufficiency in the lower limbs. Incretin mimetic medications are used for glucose control in diabetics. The effects of these drugs extend beyond glucose control. This study investigates the effects of incretin therapy on the risk of limb loss after revascularization.

Methods: The TriNetX database was utilized to identify patients who underwent lower extremity revascularization at either suprapopliteal (SP) or infrapopliteal (IP) levels. The primary outcome was the occurrence of limb loss, classified as below-the-knee (BKA) or above-the-knee amputations (AKA) following revascularization. Limb loss was compared between Cohort-1 (untreated), and Cohort-2, patients receiving incretin therapy. Propensity score matching was conducted for metabolic-endocrine diseases, COPD, use of medications (statin, metformin, insulin), and diabetes severity using HbA1c % in blood categorized as normal, prediabetic, and diabetic. Univariate analysis was then performed with chi-square tests, and odds ratios (OR) and 95% confidence intervals (CI) were provided.

Results: 10,500(55%) males and 8,518(45%) females underwent SP-level revascularization. The average age was 66±9.4 years old in the SP group. The odds of AKA were lower in treated cohorts (OR=0.49;0.39-0.62,p<0.001). The odds of BKA were also lower in the treated cohort (OR=0.47;0.39-0.57,p<0.001). 6,362(62%) males and 3,854(38%) females with an average age of 67±9.9 years old in the IP-level group. The odds of AKA (OR=0.54;0.39-0.74,p<0.001), and the odds of BKA were lower in the treated cohort (OR=0.53;0.44-0.64,p<0.001). Primary outcome is summarized in Table 1.

		Odds Ratio	95% CI	p-value
Suprapopliteal	AKA	0.49	0.39-0.62	< 0.001
Revascularization	BKA	0.47	0.39-0.57	< 0.001
Infrapopliteal	AKA	0.54	0.39-0.74	< 0.001
Revascularization	BKA	0.53	0.44-0.64	< 0.001

Table 1. Risk Analysis of limb amputation between treated and untreated groups.

AKA = Above Knee Amputation, BKA = Below Knee Amputation

Conclusion: Incretins improve limb salvage following supra and infrapopliteal revascularization. Their effect on the physiology of microcirculation is the most likely underlying mechanism. Future randomized clinical trials are needed to investigate the duration of treatment necessary for optimal outcomes.

16. Same-Day Discharge following Pediatric Thyroidectomy or Thyroid Lobectomy is Increasing and Safe in Select Cases; A NSQIP-Pediatric Analysis

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Introduction: Same-day discharge following pediatric thyroidectomy is not well-reviewed. Our aim was to evaluate outcome differences between same-day and non-same-day discharge following total or partial pediatric thyroidectomy.

Methods: Data from the Pediatric American College of Surgeons National Surgical Quality Improvement Program (NSQIP-P) was used to separately evaluate thyroidectomy and thyroid lobectomy patients from 2017 to 2021. For both, patients were stratified into two groups: patients discharged on the same calendar day (SDD) and those discharged 1-2 days post operation (non-SDD). Differences were analyzed and logistic regression performed.

Results: NSQIP-P identified 2,622 patients meeting criteria. SDD rates increased from 2017 to 2021 for both thyroidectomy (5.2% to 10.9%) and thyroid lobectomy (23.1% to 34.6%). SDD patients had significantly shorter operative times demonstrated in *Table 1*. The SDD rate was lower for pediatric surgeons compared to other specialties for both operations ($p<0.001$), without differences in outcomes by specialty or SDD status. No mortality was reported. Logistic regression demonstrated steroid use as a risk for readmission (OR 4.42, $p=0.026$) and reoperation (OR 5.99, $p=0.047$) following thyroidectomy.

Conclusion: Same-day discharge for pediatric patients undergoing thyroidectomy and thyroid lobectomy has been increasing without an increase in 30-day readmission, reoperation, or mortality. In select non-steroid using patients, same-day discharge following pediatric thyroidectomy and thyroid lobectomy appears to be a safe option.

Table 1: Clinical Characteristic and Outcome Differences for Pediatric Patients who underwent Total Thyroidectomy or Lobectomy between Same-Day Discharge (SDD) and Discharge after 1-2 days (non-SDD) Cohorts

	Variables	Same-Day Discharge, n (%)	Non-Same-Day Discharge, n (%)	*p*-value
Total Thyroidectomy	**Surgical Specialty:**			
	General Surgery	28 (10.9%)	229 (89.1%)	<0.001
	ENT	15 (11.9%)	111 (88.1%)	
	Pediatric ENT	38 (7.2%)	488 (92.8%)	
	Pediatric Surgery	37 (4.8%)	734 (95.2%)	
	Op time (min), mean (SD)	135.3 (65.8)	168.8 (77.6)	<0.001
	30-Day Unplanned Readmission	3 (2.5%)	22 (1.4%)	0.416
	30-Day Unplanned Reoperation	2 (1.7%)	10 (0.6%)	0.224
Thyroid Lobectomy	**Surg Specialty:**			<0.001
	Gen Surg	57 (49.1%)	59 (50.9%)	
	ENT	42 (45.2%)	51 (54.8%)	
	Peds ENT	109 (28.5%)	274 (71.5%)	
	Peds Surg	84 (24.3%)	261 (75.7%)	
	Op time (min), mean (SD)	95.7 (37.3)	131.6 (54.2)	<0.001
	30-Day Unplanned Readmission	2 (0.7%)	7 (1.1%)	0.728
	30- Day Unplanned Reoperation	2 (0.8%)	3 (0.6%)	0.667

17. Same-Day Discharge for Pediatric Nuss Procedure is Increasing Without Affecting Complication Rates; an Analysis of the NSQIP-Pediatric Database

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Introduction: Same-day discharge for the Pediatric Nuss procedure has been evaluated with single-center studies typically after cryoablation; however, there is minimal research analyzing pooled national data. This study aims to assess if same-day discharge for the Nuss Procedure affects postoperative outcomes.

Methods: Our analysis utilized de-identified data from the ACS NSQIP-P registry to evaluate patients from 2017-2021 who underwent the Nuss Procedure. Patients discharged the same calendar day postoperatively (SDD) were compared to those discharged 1 to 7 days after surgery (non-SDD) for the primary outcome of unplanned readmission within 30 days of surgery in SPSS.

Results: A total of 4,177 patients were identified who underwent the Nuss Procedure between 2017 and 2021. The SDD rate has increased in frequency from 2018 (0.8%) to 2021 (2.1%). Overall, there was no significant difference between SDD and non-SDD groups for 30-day unplanned readmission rates (1.8% vs 3.5%, p=0.723), reoperation rates (0% vs 1.5%, p=1.000), or other postoperative complications (Table 1). Binary logistic regression demonstrated asthma (OR 1.78, p=0.029) increased risk of readmission or reoperation within 30 days.

Conclusion: Same-day discharge for Nuss procedure has increased in frequency without significant differences in postoperative outcomes. Most early reoperations were due to pneumothorax, readmissions due to pain, and were significantly increased by presence of asthma. Same-day discharge for Nuss procedure can be reasonable for non-asthmatic patients with a satisfactory postoperative x ray and adequate pain control.

Table 1: Demographic, Clinical Characteristics, and Outcome Differences for Pediatric Nuss Procedure for Patients Who Underwent Same-Day Discharge versus Discharge between 1 and 7 days

Demographics, Clinical Characteristics and Outcomes	Same-Day Discharge (< 1 day) n = 56 (1.3%)	Non-Same-Day Discharge (Days 1 -7) n = 4121 (98.7%)	*p*-value
Age (years), mean (SD)	15.6 (1.2)	15.3 (1.5)	0.091
Weight (kg), mean (SD)	59.9 (11.7)	56.1 (11.0)	0.019
Op time (min), mean (SD)	102.9 (41.9)	105.8 (44.9)	0.606
Bleeding Events	0	3 (0.1%)	1.000
Surgical Site Infection			
Superficial	2 (3.6%)	40 (1.0%)	0.108
Deep	0 (0%)	14 (0.3%)	1.000
Organ Space	0 (0%)	16 (0.4%)	1.000
Wound Dehiscence	0 (0%)	3 (<0.1%)	1.000
30-Day Unplanned Readmission	1 (1.8%)	146 (3.5%)	0.723
30-Day Unplanned Reoperation	0 (0%)	60 (1.5%)	1.000
30- Day Mortality	0 (0%)	0 (0%)	-

18. Same-Day Discharge for Elective Pediatric Laparoscopic Gastrostomy Tube Insertion is Safe and Increasing in Frequency; a NSQIP-Pediatric Retrospective Review 2017 to 2021

John M. Woodward, MD (Res), Caitlin Chunco, BS, Stephanie Brierley, MD (Res), Krystle Bittner, MPH, Hector Osei, MD, Carroll Harmon, MD, PhD, P. Benson Ham III, MD, MS
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Introduction:

There is limited literature reviewing same-day discharge for elective pediatric gastrostomy tube placement. Our aim was to assess the outcomes of same-day discharge following elective pediatric laparoscopic gastrostomy.

Methods: Data from the ACS NSQIP-P registry was used to evaluate elective pediatric laparoscopic gastrostomy patients who presented from home and were discharged home with a diagnosis of failure to thrive, feeding difficulty or dysphagia from 2017-2021. Patients discharged postoperatively the same calendar day (SDD) were compared to those discharged 1-2 days postoperatively (non-SDD) for the primary outcome of unplanned readmission within 30 days. Secondary outcomes included bleeding events, wound infection, and reoperation.

Results: There were 5947 patients identified; 4.7% were SDD. The rate increased from 2.7% (2017) to 6.3% (2021). There were no significant differences for 30-day unplanned readmission, reoperation, or any complication (Table 1). Binary logistic regression found steroid use within 30 days increased risk of serious complication (OR 2.02, 95% CI 1.29-3.15, *p*=0.002) and 30-day readmission or reoperation (OR 2.10, 95% CI 1.34-3.27, *p*=0.001). All 6 patients (0.1%) who required reoperation within 2 days were identified prior to discharge, and none of the 16 patients readmitted within 2 days of surgery required reoperation. No mortality was reported for SDD.

Table 1: Clinical Characteristics and Outcome Differences between Same-Day Discharge (SDD) and Discharge Postoperative Day 1 or 2 (non-SDD) Cohorts

Clinical Characteristics and Outcomes	SDD n = 281 (4.7%)	Non-SDD (Days 1 & 2) n = 5666 (95.3%)	*p*-value
Age (yr) mean (SD)	4.16 (4.48)	3.28 (4.01)	0.002
Weight (kg), mean (SD)	14.06 (9.96)	12.17 (8.92)	0.002
Ventilator Dependance	7 (2.6%)	39 (0.7%)	0.005
Asthma	37 (13.2%)	402 (7.1%)	<0.001
Oxygen Support	14 (5.0%)	342 (6.0%)	0.522
Previous Cardiac Surgery	23 (8.2%)	692 (12.2%)	0.048
Devo Delay	168 (59.8%)	3410 (60.2%)	0.901
Seizure Diagnosis	70 (24.9%)	1357 (23.9%)	0.721
Steroid Use	10 (3.6%)	145 (2.6%)	0.332
Hematologic Disorder	18 (6.4%)	371 (6.5%)	1.000
ASA Class			
ASA 1	2 (0.7%)	50 (0.9%)	0.232
ASA 2	70 (25.1%)	1643 (29.1%)	
ASA 3	201 (72.0%)	3751 (66.4%)	
ASA 4	6 (2.2%)	206 (2.6%)	
Operative time (min), mean (SD)	33.15 (19.46)	43.83 (27.60)	<0.001
Surgical Site Infection			
Superficial	9 (3.2%)	166 (2.9%)	0.856
Deep	0 (0%)	5 (<0.01%)	1.000
Organ Space	0 (0%)	2 (<0.01%)	1.000
Wound Dehiscence	0 (0%)	2 (<0.01%)	1.000
Post-Operative Pneumonia	2 (0.7%)	30 (0.5%)	0.662
Bleeding	0 (0%)	4 (<0.01%)	1.000
2-d Readmission or Reoperation	2 (0.7%)	20 (0.3%)	0.279
Unplanned Readmission (30-d)	24 (8.5%)	436 (7.7%)	0.407
Reoperation (30-d)	3 (0.1%)	77 (1.4%)	1.000
Serious Complication*	25 (8.9%)	451 (8.0%)	0.573
Mortality (30-d)	0 (0%)	6 (0.1%)	1.000

* Serious Complication Defined as 30-day Mortality, Readmission, Reoperation, Transfusion, Sepsis, Cardiac Arrest, Unplanned Intubation, Pneumonia, Deep and Organ Space infections

Conclusion: Same-day discharge rates after pediatric laparoscopic gastrostomy tube placement are low but increasing. For elective patients presenting from home and discharged home, there were not significant differences in outcomes between same-day and non-same day discharge cohorts. In select patients, same-day discharge following laparoscopic gastrostomy is a safe option.

19. Trends and Outcomes in Pediatric Laparoscopic Appendectomy: A NSQIP-P Analysis of Same-Day Discharge and Readmission Rates

John M. Woodward, MD (Res), Stephanie Brierley, MD (Res), Krystle Bittner, MPH, Katherine Foote, MA, Hector Osei, MD, Carroll Harmon, MD, PhD, P. Benson Ham III, MD, MS

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Background: Same-day discharge for pediatric laparoscopic appendectomy in prior literature is safe, however, national practice patterns are not well analyzed over time. The aim of this paper is to evaluate current national practice patterns and 30-day readmission rates of same-day discharge after laparoscopic appendectomy for non-perforated appendicitis.

Methods: The NSQIP-P registry identified patients from 2017-2021 who underwent laparoscopic appendectomy for non-perforated appendicitis. ASA 4 or 5, and patients with concurrent CPT codes were excluded. Annual same-day discharge (SDD) rate was determined. The outcomes of SDD patients were compared to those discharged postoperatively day 1-2 (non-SDD). Sub-group analysis was performed for acute appendicitis with localized peritonitis, without perforation or gangrene (ICD10=K35.30).

Results: A total of 73,465 pediatric patients were identified. The SDD rate increased from 33.3% (2017) to 52.5% (2021), with decreased 30-day readmission between SDD and non-SDD (1.3% vs 2.1%, p<0.001). Sub-group analysis identified 7,330 patients with annual SDD rates from 50.7% (2019) to 60.4% (2021) with decreased unplanned 30-day readmission (1.3% vs 2.1%, p<0.001) for SDD versus non-SDD. There was no increase in 30-day adverse events for SDD for either analysis.

Same-Day Discharge Rate for Laparoscopic Appendecomy
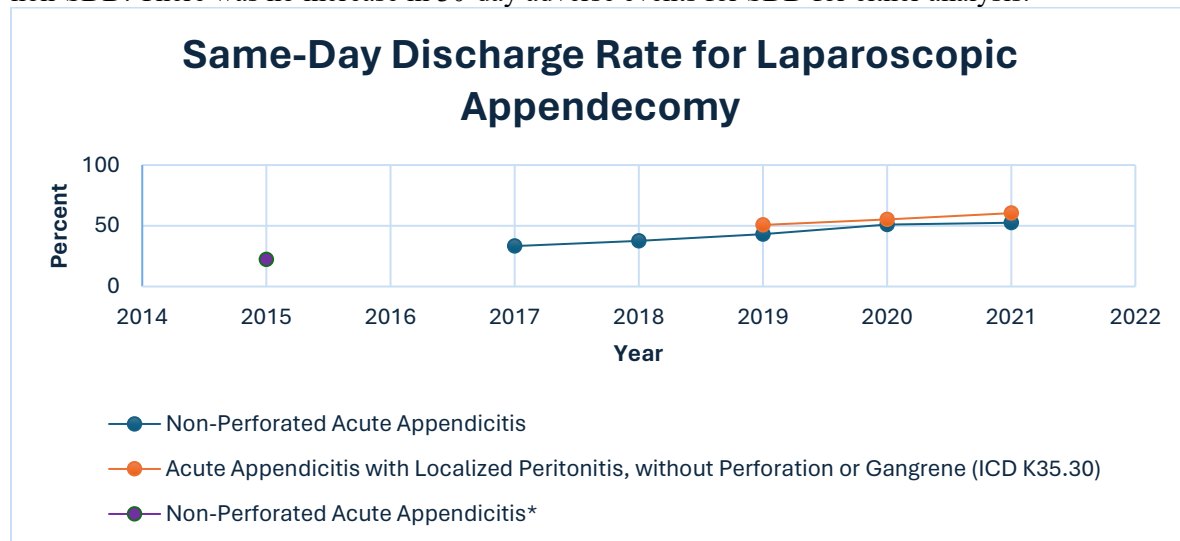
*NSQIP-P analysis 2012 to 2015 by: Cairo SB, Raval MV, Browne M, Meyers H, Rothstein DH. Association of Same-Day Discharge With Hospital Readmission After Appendectomy in Pediatric Patients. JAMA Surg 2017;152(12):1106-12

Conclusion: Same-day discharge after laparoscopic appendectomy for non-perforated acute appendicitis in the pediatric population continues to increase in frequency nationally, recently surpassing 50% of patients. In this analysis, patients discharged same-day had no significant increase in 30-day adverse outcomes with SDD rates 20-30% lower than previously published single center data with similar safety reporting, indicating there is a larger percent of patients that could discharge same-day nationally.

20. Same-Day Discharge for Elective Pediatric Gastrostomy Closure has Improved Readmission and Reoperation Rates Compared to Non-Same-Day Discharge; A NSQIP-Pediatric Analysis

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Introduction: Same-day discharge (SDD) for pediatric gastrostomy closure is common; however, it has not been well reviewed in the literature. This paper aims to assess the effect of SDD on post-operative outcomes following elective gastrostomy closure in pediatric patients.

Methods: The National Surgical Quality Improvement Program-Pediatric registry was queried for patients from 2017-2021 who underwent elective gastrostomy closure. Patients discharged postoperatively the same calendar day (SDD) were compared to those discharged 1-2 days postoperatively (non-SDD).

Results: A total of 6,607 patients were identified. Most patients discharged same-day (79.7%) with rates increasing from 2017 (73.6%) to 2021 (82.2%). There was a significant difference in 30-day unplanned readmissions (2.5% vs 4.6%; $p=<0.001$) and reoperations (0.9% vs 1.8%, $p=0.004$) between SDD and non-SDD, respectively. Logistic regression showed decreased odds of SDD for Hispanic patients (OR 0.702; $p<0.001$) and patients with hematologic disorders (OR 0.699; $p=0.012$); however, Hispanic ethnicity was non-significant for 30-day readmission or reoperation ($p=0.371$), while hematologic disorders remained significant (OR 1.892; $p=0.006$). Only 4 patients (0.06%) required reoperation within 2 days.

Conclusion: Same-day discharge for pediatric patients undergoing elective gastrostomy closure is frequent (>75%). Patients discharged the same-day compared to 1-2 days postoperatively had significant decreases in 30-day readmission and reoperation. The presence of hematologic disorder increased odds of readmission and reoperation. These patients should be considered for delayed discharge. Patients of Hispanic ethnicity had decreased odds of same-day discharge without influencing readmission or reoperation, implying that this factor may bias decision-making without impacting outcomes, which should be further studied.

Table 1: Differences between Same Day Discharge (SDD) and Discharge 1-2 Days Postoperatively (non-SDD) for Elective Gastrostomy Closure

Variables	SDD n = 5215 (79.7%)	Non-SDD (Days 1 & 2) n = 1328 (20.3%)	*p*-value
Age, yr, mean (SD)	6.14 (4.54)	6.30 (4.65)	0.295
Weight (kg), mean (SD)	21.08 (15.37)	21.80 (16.21)	0.141
Hispanic Ethnicity, n (%)	904 (18.3%)	277 (23.3%)	<0.001
Hematologic Disorder, n (%)	320 (6.1%)	120 (9.0%)	<0.001
Op time (min), mean (SD)	39.7 (22.7)	59.4 (35.9)	<0.001
Wound Dehiscence, n (%)	29 (0.6%)	10 (0.8%)	0.424
Unplanned Readmission (30-d), n (%)	115 (2.2%)	58 (4.4%)	<0.001
Unplanned Reoperation (30-d), n (%)	45 (0.9%)	24 (1.8%)	0.004
Mortality (30-d), n (%)	0 (0%)	0 (0%)	-

21. National Practice Patterns of Same-Day Discharge for Pediatric Laparoscopic Cholecystectomy Utilizing NSQIP Pediatric Registry

John M. Woodward, MD (Res), Stephanie Brierley, MD (Res), Krystle Bittner, MPH, Katherine Foote, MA, Hector Osei, MD, Carroll Harmon, MD, PhD, P. Benson Ham III, MD, MS

Division of Pediatric Surgery, Oishei Children's Hospital

Purpose: Same-day discharge for pediatric laparoscopic cholecystectomy is often performed, however national practice patterns have not been well studied. Adult National Surgical Quality Improvement Program (NSQIP) data for elective laparoscopic cholecystectomy reports same-day discharge rates of 65%. The aim of this paper is to assess national practice patterns of same day discharge for pediatric laparoscopic cholecystectomy and postoperative readmission rates.

Methods: Utilizing the NSQIP pediatric registry, patients from 2017-2021 that underwent laparoscopic cholecystectomy who were discharged same-day postoperatively were compared to those discharged 1-2 days postoperatively. Same-day discharge rates were determined for each year, and the data was analyzed utilizing SPSS. Subgroup analysis was performed on acute cholecystitis, symptomatic cholelithiasis, choledocholithiasis, biliary pancreatitis, other specified biliary diagnoses, and on all elective cases.

Results: A total of 15,880 patients were identified with 36% of patients undergoing same-day discharge. The rate increased from 33% in 2017 to 41% in 2021. In subgroup analysis, there was minimal increase in same-day discharge for acute cholecystitis (23% to 25.5%), however the change was larger for symptomatic cholelithiasis (35.9% to 49%) and biliary pancreatitis (5.7% to 18.5%) from 2017 to 2021 respectively (Figure 1). The overall elective same-day discharge rate was 43%. There was no significant difference in unplanned 30-day readmission between patients discharged same-day versus not for acute cholecystitis (2.8% vs 2.9%, p=0.833), choledocholithiasis (2.1% vs 4.1%, p=0.133), other specified diagnoses (used for biliary dyskinesia among others) (2.1% vs 0.6%, p=0.471), and biliary pancreatitis (1.0% vs 3.5%, p=0.345). There was a significant decrease in readmissions for those discharged the same day versus not for all cases (2.0% vs 3.0%, p<0.001), elective cases (1.7% vs 2.5%, p=0.004) and symptomatic cholelithiasis (1.7% vs 3.0%, p<0.001).

Figure 1: Trend of Percent Same-Day Discharge Compared to 1-2 Day Discharge for Laparoscopic Cholecystectomy in Pediatric Patients Utilizing NSQIP-P Registry
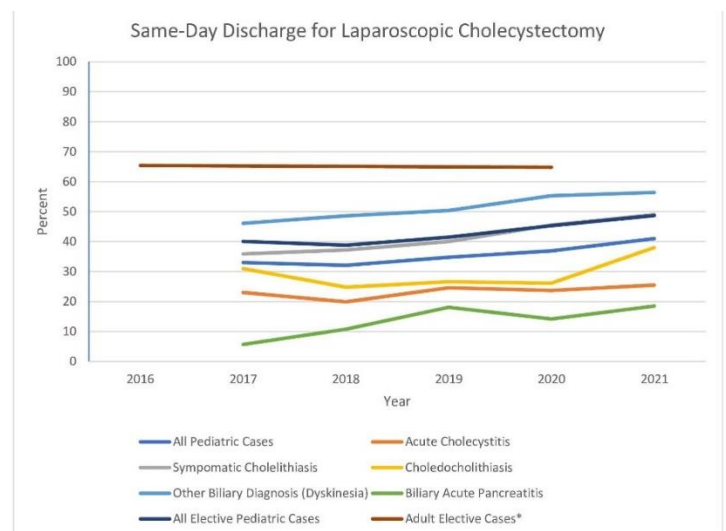
*NSQIP-Adult analysis performed on 2016 to 2020 data reviewing discharge practice patterns, with same-day discharge rates reported for laparoscopic cholecystectomy: Shariq OA, Bews KA, Etzioni DA, Kendrick ML, Habermann EB, Thiels CA. Performance of General Surgical Procedures in Outpatient Settings Before and After Onset of the COVID-19 Pandemic. JAMA Network Open 2023;6(3):e231198-e.

Conclusion: Same-day discharge for pediatric patients undergoing laparoscopic cholecystectomy has slowly been increasing each year, without increased rates of readmission overall, and decreasing rates of readmission for some diagnoses. However, compared to previously published adult data, pediatric patients undergoing elective laparoscopic cholecystectomy are about one third less likely to be discharged same-day.

22. Same-Day Discharge for Pediatric Pyloromyotomy May Slightly Increase Emergency Room Visits for Emesis without Impacting Other Complication Rates, Making Early Discharge Reasonable in Select Patients: A NSQIP-P Analysis

John M. Woodward, MD (Res), Michael LaRock, BS, Stephanie Brierley, MD (Res), Krystle Bittner, MPH, Hector Osei, MD, Carroll Harmon, MD, PhD, P. Benson Ham III, MD, MS

Division of Pediatric Surgery, Oishei Children's Hospital

Introduction: Ad-lib feeding protocols following pediatric pyloromyotomy have decreased length of stay, however literature evaluating same-day discharge is lacking. The aim of this study is to evaluate outcomes of same-day discharge following pediatric pyloromyotomy.

Methods: The 2017-2021 NSQIP-P Database was queried for pyloric stenosis patients undergoing laparoscopic pyloromyotomy. Preterm infants and patients aged <4 weeks or >6 months were excluded. Open surgeries were excluded. The patients were stratified into two groups: patients discharged postoperatively the same calendar day (SDD) and those discharged 1-2 days postoperatively (non-SDD). Clinical characteristics and outcomes were analyzed in SPSS.

Results: There were 5,851 patients identified; 367 (6.3%) underwent SDD. There were significant differences between SDD and non-SDD in weight and operative time (Table 1). Overall, 22 patients (0.4%) required readmission in 2 days with a slightly higher rate occurring in patients undergoing SDD compared to non-SDD (1.4% vs 0.3%, p=0.010). All listed reasons for the same day discharge readmissions were vomiting; none required reoperation. Otherwise, there were no significant outcome differences (Table 1). Binary logistic regression demonstrated higher ASA Classes (II, III, and IV) significantly increased odds of 30-day readmission with ASA 4 having the most significant impact (OR 8.89, 95% CI 2.38-33.26, p=0.001).

Conclusion: Same day discharge for laparoscopic pyloromyotomy is reasonable in select patients with lower ASA class who are tolerating feeds, however this may lead to a slight increase in readmission for postoperative emesis without increasing rates of reoperation or other complications.

Table 1: Clinical Characteristics and Outcomes for Pediatric Laparoscopic Pyloromyotomy Patients Undergoing Same-Day Discharge (SDD) and Discharge between 1 and 2 days (non-SDD)

Clinical Characteristics and Outcomes	SDD n = 367 (6.3%)	Non-SDD (Days 1 & 2) n = 5484 (93.7%)	*p*-value
Age (wks), mean (SD)	6.47 (2.10)	6.28 (2.17)	0.091
Weight (kg), mean (SD)	4.29 (0.78)	4.20 (1.03)	0.035
Operative time (min), mean (SD)	23.30 (10.47)	29.43 (13.35)	<0.001
Unplanned Readmission (2-d)	5 (1.4%)	17 (0.3%)	0.010
Reoperation (2-d)	0 (0%)	7 (0.1%)	1.000
Unplanned Readmission (30-d; excluding for emesis in 2-d)	10 (2.7%)	119 (2.2%)	0.581
Reoperation (30-d)	1 (0.3%)	29 (0.5%)	1.000
All Complications Excluding Readmission for Emesis (2-d)	13 (3.6%)	175 (3.2%)	0.758
Mortality (30-d)	0 (0%)	3 (<0.1%)	1.000

* All Complications Defined as 30-day Mortality, Readmission, Reoperation, Transfusion, Sepsis, Cardiac Arrest, Unplanned Intubation, Pneumonia, Wound Dehiscence, Superficial, Deep and Organ Space Infections

Jacobs School of Medicine
and Biomedical Sciences
University at Buffalo

Poster Presentations
Group 3

23. Dye-less Quantification of Tissue Perfusion by Laser Speckle Contrast Imaging Offers Equivalence to Clinically Validated Quantified Indocyanine Green in Porcine Model

Garrett C. Skinner, MD, Mikael Marois, PhD, John G. Oberlin, PhD, Christopher J. McCulloh, MD, Steven D. Schwaitzberg, MD, Peter C.W. Kim, MD, PhD

University at Buffalo, Department of Surgery, Activ Surgical Inc., Boston MA

Background: Subjective surgeon interpretation of near infrared perfusion imaging is fraught with low interobserver agreement and poor correlation to clinical outcomes like anastomotic leak. In contrast, indocyanine green (ICG) quantification (Q-ICG) has shown to be correlated to histology of relative tissue perfusion as well as human clinical outcomes. Q-ICG measures change in signal intensity emitted from dye over time, and normalized ingress slope is the parameter most correlated with clinical endpoints. Because of the dye and time requirement, Q-ICG offers poor spatial resolution and inability to perform repeated measurements. Alternatively, laser speckle contrast imaging (LSCI) quantification (Q-LSCI) has the advantage of measuring perfusion in real-time without contrast dye but its correlation with clinical outcomes needs to be further validated. In this study, we hypothesize Q-LSCI correlates with and discriminates tissue ischemia equivalent to validated Q-ICG in a porcine model.

Methods: Nine sections of small intestine in three female Yorkshire swine were devascularized. At a fixed distance and angle, pairs of ICG and LSCI video were quantified within perfused, watershed, and ischemic regions of interest (ROI). Q-ICG was calculated using normalized ingress slope. We measured Q-LSCI using laser speckle perfusion units (LSPU), which are affected by distance, and angle from the tissue. To minimize these factors, we also quantify using relative perfusion units (RPU) and time-based cross correlation (X-corr), which compare LSPU to a reference region. Pearson correlation coefficient was used to assess correlation and Student's T and Mann-Whitney U tests were used to test for differences between ROIs.

Results: Q-LSCI using RPU had the closest correlation with Q-ICG (r=0.79, p=1.9E-35) compared LSPU (r=0.74, p=6.5E-29) and X-corr (r=0.38, p=6.3E-7). Ischemic and perfused ROIs had mean normalized ICG slope of 0.028 (SD 0.015) and 0.155 (SD 0.028, p=2.92E-09) and RPU values of 0.15 (SD 0.04) and 0.68 (SD 0.013, p=2.5E-23)

Conclusion: These results demonstrate that Q-LSCI using RPU discriminates ischemic from perfused tissue as well as clinically validated Q-ICG. X-corr did not correlate as well, suggesting variation in LSPU over time is not as indicative of tissue perfusion compared to average values. Although LSPU alone correlated well, it does not account for
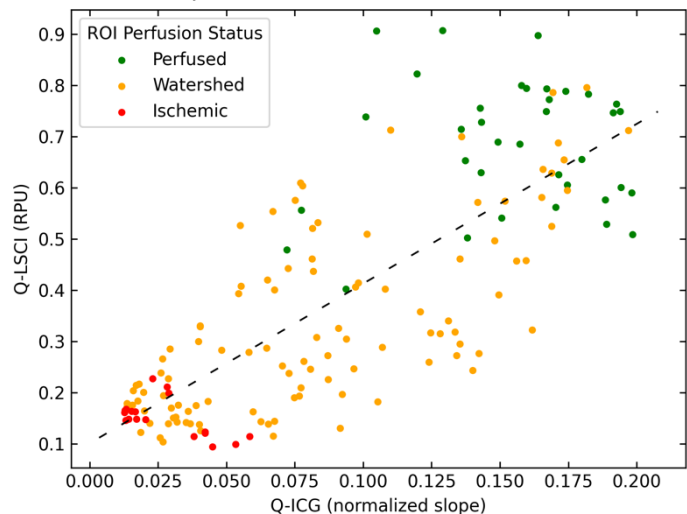

Figure 1. Correlation of quantified laser speckle (Q-LSCI) within regions of interest (ROI) using relative perfusion units (RPU) to quantified indocyanine green (Q-ICG) using normalized ingress slope.

differences caused by distance and angle to the tissue, which were controlled in this study. This suggests that LSCI may be able to offer clinically predictive real-time dye-free quantification of tissue perfusion. Further work should include validation in human clinical trials.

Presenter: Garrett Skinner (Resident

24. Real-time Near Infrared Artificial Intelligence using Scalable Non-Expert Crowdsourcing in Colorectal Surgery

Garrett C Skinner, MD, Tina Chen, Gabriel Jentis, Yao Z Liu, MD, Christopher J McCulloh, MD, Alan Harzman, MD, Emily Huang, MD, Matthew Kalady, MD, Peter CW Kim, MD PhD

University at Buffalo, Department of Surgery, Activ Surgical, Warren Alpert Medical School Alpert Medical School of Brown University, The Ohio State University Wexner Medical Center

Background: Surgical artificial intelligence (AI) has the potential to improve patient safety and clinical outcomes. To train supervised models, experts must spend hours crafting detailed annotations. These annotations may include drawing intricate outlines around anatomy. Currently, expert domain knowledge is thought to be required to make anatomy annotations. Because of this, annotating is the rate limiting step in developing surgical AI models, keeping potential benefits of surgical AI unrealized. Crowdsourcing is when many laypersons without domain expertise create annotations. Previously, crowdsourcing was shown to produce accurate annotations of rigid, non-deformable structures such as instruments. Here we describe the application of crowdsourcing to obtain high quality annotations of surgical anatomy, showing how crowdsourcing expedited our development of a highly accurate AI-assisted near infrared imaging system by saving significant expert annotation hours.

Methods: 27,000 video frames from 95 de-identified colorectal procedures were included for model training. Annotations of bowel and abdominal wall were obtained using a gamified crowdsourcing platform utilizing continuous performance monitoring and incentivization. Annotation instructions were crafted utilizing little to no domain knowledge and using surgical data science best practices. An AI model called Bowel Crowdsourced Segmentation (*Bowel.CSS)* was trained using the crowdsourced annotations to identify bowel and abdominal wall. Accuracy of the crowdsource workers and trained model were compared to expert annotations on a holdout dataset using the harmonic mean of precision and recall (F1). A version of this model was deployed in combination with near infrared imaging.

	CROWDSOURCE	***BOWEL.CSS***
Bowel	0.86 ±0.20	0.89 ±0.16
Abdominal wall	0.79 ±0.26	0.76 ±0.28

Results: *Bowel.CSS* was trained by 206 crowdsource workers; 3% (7) identifying as MDs and 1% (2) as surgical MDs. On average an expert spent 120 seconds annotating bowel and abdominal wall, extrapolating to 902 expert hours saved by using crowdsourcing to annotate the 27,000-frame dataset. In the holdout dataset, crowdsource workers and *Bowel.CSS* were highly accurate compared to expert annotations, and the model was deployed and successfully segmented bowel tissue in real-time (Fig. 1).

Figure 2. Accuracy (F1) of crowdsourcing and Bowel.CSS compared to expert annotations. Deployed AI-assisted near infrared imaging system.

Conclusion: Here we obtained accurate annotations of surgical anatomy using gamified, non-expert crowdsourcing. We validated this by training a highly accurate AI model, greatly accelerating the speed of development by eliminating over 900 expert annotation hours. Adoption of this crowdsource methodology could help accelerate innovation within AI-assisted surgery.
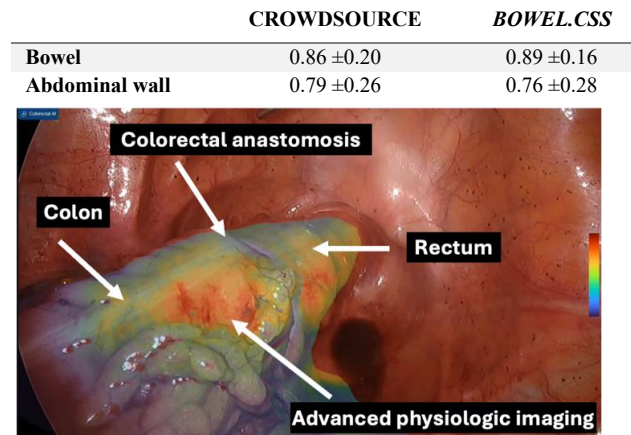
25. Catastrophic Health Expenditures for Colorectal Cancer Care: A Retrospective Analysis of the First Private Comprehensive Cancer Center In Lagos, Nigeria

Frankie I. Uwechue MD; Norah N. Zaza MD; Matt Caputo BS; Zainab Adegbite MPH; Chinenye Iwuji BM, PhD; Chukwumere Nwogu MD PhD; Bindiya Chugani BS; Kristina Diaz MSN, RN; Juliet S. Lumati MD, MPH

Personal Affiliation: Resident, Department of Surgery, University at Buffalo, Jacobs School of Medicine
Other Affiliations: Department of Surgery, Northwestern University Feinberg School of Medicine; Department of Oncology, Lakeshore Cancer Center, Lagos, Nigeria; Department of Surgical Oncology, Roswell Park Comprehensive Cancer Center

Introduction: Nearly a billion people worldwide risk Financial Catastrophe (FC) due to out-of-pocket (OOP) health expenditures. With low-middle income countries disproportionately impacted, and the global burden of Colorectal cancer (CRC) expected to increase 60% by 2030, Nigeria- 50% of whose 200 million strong population lives in poverty- is of interest. This study aims to evaluate the cost of treating CRC at Nigeria's first cancer center.

Methods: We queried the cancer registry for patients diagnosed with CRC between 2013-2023. Treatment costs were abstracted from bills in patient charts (adjusted to 2023 USD), as were demographic and clinical characteristics. FC was defined as OOP >20% of Nigeria's 2023 per capita GDP ($467). Two-sided Student's t-tests were used to compare total OOP by stage and cancer site ($\alpha = 0.05$).

Results: 91 patients (59% female, median age 58 , colon (n=69), rectum (n=22), 14% stage 1-2, 15% stage 3, 66% stage 4) were included. Average chemotherapy cost was $7,877 and procedure cost was $1,156. Average total cost for undergoing both procedures and adjuvant therapies was $39,333 (>80 x national GDP). Stage 3-4 patients spent $12,000 more than stages 1-2 ($p<.01$), and colon cancer care cost $9,500 more than rectal. All patients regardless of treatment modality risked FC. The greatest contributors to total cost were chemotherapy (30%) and other drugs (21%). Procedures accounted for 3%.

Total Treatment Cost Adjusted to 2023 USD				
Characteristic	**Mean(SD)**	**Financial Catastrophe n (%)**	**N**	**p-value***
Topography				
Colon	14258 (37547)	46 (67%)	69	0.052
Rectum	4737 (7954)	15 (68%)	22	
Cancer Stage				
Unknown	2554 (2345)	3 (75%)	4	
1, 2	2381 (2736)	8 (62%)	13	
3	7440 (11637)	10 (71%)	14	<.01
4	15712 (39949)	40 (67%)	60	
*T-test performed for difference of means				

Conclusion: Treatment costs for CRC are highly catastrophic. Without risk protection through insurance or financial navigation, CRC care increases the risk of poverty for nearly all patients who undergo treatment.

26. Surgical Chronicles: A Bibliometric Exploration of Healthcare Disparities in Scientific Publications over Five Decades

Degen Mariniello, BS; Joseph C L'Huillier, MD; Jinwei Hu, MD; Weidun A Guo, MD, PhD

Introduction: Healthcare disparities in surgery remains a significant problem and has garnered increased attention over the past decade. However, the quantity of research output on the topic is unknown. We sought to investigate trends, patterns, and shifts in the discourse surrounding healthcare disparities in surgery over the past five decades.

Methods: We performed a bibliometric analysis of general surgery publications between 1960 and 2019 from the top 5 impact factor surgery journals: JAMA Surgery, Annals of Surgery, British Journal of Surgery, Surgery, and Journal of the American College of Surgeons. Bibliometric data was extracted from PubMed. Keyword co-occurrence analysis was performed using VosViewer and Microsoft Excel. Word clouds using the most frequently occurring 500 keywords and their interconnectivity were developed for each decade. Trends in terms pertaining to healthcare disparities by decade were visualized via line graphs.

Results: A total of 88,292 articles were published in the study period with the majority being from the 2010s (18,355). The first keyword pertaining to healthcare disparities was "socioeconomic factors" and emerged in the 2000s. Additional keywords including "healthcare disparities" and "Black or African American" emerged in the top 500 keywords in the 2010s (Figure A). All keywords pertaining to healthcare disparities cumulatively totaled 0.31% of keyword occurrences in the 2010s (Figure B).

Conclusions: This bibliometric analysis showed the emergence and rise in healthcare disparities in surgery publications began in the 2000s with continued growth in the 2010s but still comprises a nominal percentage of total publications. With an increasingly diverse patient population, understanding and mitigating these disparities are essential for ensuring equitable access and outcomes in surgical practice. Future work will assess continued trends into the 2020s and beyond.
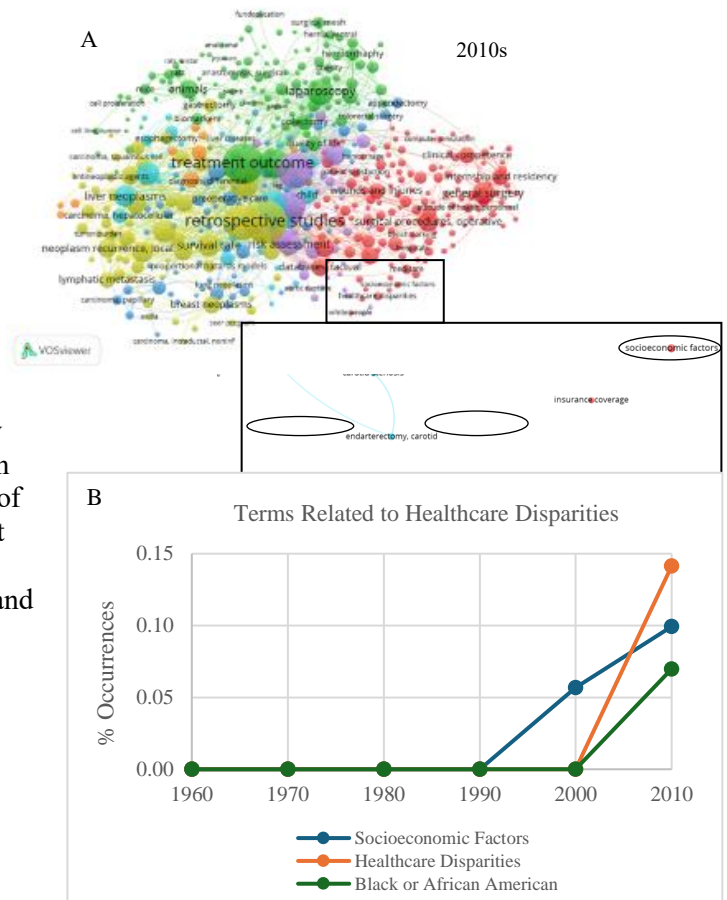
Terms Related to Healthcare Disparities

27. The Forgotten Father of Modern Operative Surgery from the Islamic Golden Age: Abu al-Qasim Al Zahrawi and his Timeless Legacy

Muhammad Ali Awan, MD, Weidun Alan Guo, MD, PhD, FACS.

UB Department of Surgery

Background: While popular accounts of surgical history have predominantly highlighted Western pioneers, a hidden gem emerges from the forgotten folds of the Muslim world. Abu al-Qasim Al Zahrawi (known as Albucasis in the West) is an unsung hero and the forgotten father of operative surgery. Long before the ban on human dissection ended in 15th century Europe, Dr. Al Zahrawi was driving innovation in surgery. Here, we redirect our gaze beyond the Renaissance luminaries such as Vesalius, Pare, Harvey, and Lister and acknowledge that the roots of surgical advancement delve much deeper than the commonly celebrated European era.

Methods: Literature search for contributions by Dr. Al Zahrawi using PubMed and Google Scholar.

Synopsis/Results: Dr. Al Zahrawi was born in 936 A.D. during the Golden Age of Arab Spain. He belonged to the tribes originating from the Arabian Peninsula and served as the physician to King Al-Hakam-II of Spain. His medical education was shaped by the study of Greek and Roman medical literature which ultimately laid the groundwork for his future groundbreaking contributions.

Dr. Al Zahrawi's magnum opus, *Al Tasreef Liman 'Ajaz 'Aan Al-Taleef*, was a medical encyclopedia comprised of thirty volumes that took over fifty years to create. He described the ligature of blood vessels preceding Ambroise Paré by 600 years and pioneered the use of catgut suture for internal stitching which is utilized to this day. He was the first to detail the treatment of various anorectal diseases in both children and adults including anal fistulas, hemorrhoids, and imperforate anus. The principles he established in treating these conditions continue to be applied in today's practice. In addition, he crafted hundreds of surgical tools including hooks to remove nasal polyps, grasping forceps, and speculums. Unlike his Roman and Greek predecessors, his instruments served a specific surgical purpose (e.g. stone removal) and were on a handle which increased their ergonomics. For example, the Mokhdea was a surgical knife the first of its kind which consisted of a handle and retractable blade. Evolved versions of such instruments are used today in the fields of OBGYN, ENT, and Ophthalmology. Dr. Al Zahrawi was unique at the time as he published drawings of his tools which later served as building blocks for innovation.

Dr. Al Zahrawi's work extended beyond his era and became a reference during the European Renaissance. European scholars such as Gerard of Cremona translated "Al Tasreef' into Latin and Guy de Chauliac, a leading 14th-century French surgeon during the Bubonic Plague, quoted his work over two hundred times.

Historical Significance/Conclusion: Acknowledging the contributions of Dr. Al Zahrawi challenges the narrative dominated by Western figures in surgical history. Painting a comprehensive and inclusive picture of surgical innovation fosters a deeper understanding of the interconnected history that has shaped modern surgical practices.

28. Higher Rates Of Colon Cancer In Delayed Appendectomy Patients:

Adam H. Abbas B.S., *Rachel Lippman B.S., Anneliese Markus B.S., Csaba Gajdos M.D., Toni Ferrario M.D., Nader D. Nader M.D., Ph.D.

Jacobs School of Medicine and Biomedical Sciences at University at Buffalo, Buffalo, NY
Department of Anesthesiology, University at Buffalo, NY
Department of Surgery, University at Buffalo, NY

Background: Colon cancer is a major health concern, as it is the second leading cause of cancer deaths in the United States. Many lifestyle factors are strongly associated with the development of colon cancer[1]. Additionally, many studies in the literature have shown an increased risk of developing colon cancer in patients who have had acute appendicitis. This study further investigates the association between indolent appendicitis and the subsequent development of colon cancer.

Methods: The diamond network within the TriNetX database was queried for patients who underwent a latent appendectomy (Cohort 1) and primary appendectomy (Cohort 2). The outcome criteria were defined as a diagnosis of malignant neoplasm (ICD10:C18) of the colon on the same day or after the appendectomy. Analysis was performed before and after propensity score matching.

Results: After propensity score matching there were 19,242 patients in each group. Average age was 52, 68% were female, 32% were male. The frequency of colon cancer in cohort 1 and cohort 2 were 1,125 (6.2%) and 324 (1.7%) respectively. The odds ratio of having colon cancer in cohort 1 was OR 3.81 (3.36-4.32) when compared to cohort 2.

Conclusion: Latent appendectomy patients were associated with a fourfold increase of having colon cancer. Future work will elucidate the primary reason for surgery in these latent appendectomy patients to better understand the pathophysiology of this increased risk for colon cancer.

29. Cost of Cancer: The Effects of Pediatric Cancer on Financial Health of Caregivers.

Maria Fayyaz, Kamryn Amici, Liam Clancy, Richard Lagutaine, Tessa Morris, Reshub Pendyala, Rene Bouchard, Elizabeth A. Gage-Bouchard, PhD

Nichols School, Department of Cancer Prevention and Control, Roswell Park Comprehensive Cancer Center

Background: Pediatric cancer is rare and unexpected. Families that face pediatric cancer diagnoses are unprepared for the new financial burdens. In this study, the financial burdens these families faced stood out compared to the other obstacles. The financial burden is important because a family's financial health often affects patient outcomes.

Methods: This study analyzed responses to open-ended questions that were part of a larger survey administered to parents of pediatric cancer patients between 2018 and 2021. The part of the survey analyzed included four questions: "How do the challenges of caring for your child impact your ability to care for yourself", "What kind of help would make it easier for you to care for your child", "What has not helped in caring for your child", "Please describe any major ways you and/or your family have been impacted by your child's cancer". First, the authors reviewed the data set individually and constructed coding memos that described emergent themes. At a subsequent coding meeting, the authors developed a codebook that focused on three financial themes: Work, Costs, and Support. The data set was then coded by each author individually, with intermittent coding meetings to address inconsistencies. A second round of coding further explored the nuances of each theme within the responses.

Results: During coding, several patterns emerged. While some parents reported that they received financial support, many expressed a need for support. For example, in the question "what kind of help would make it easier for you to care for your child", one response described the need for "getting help for now paying my mortage [*sic*], car payments, taxes and utilities", illustrating their need for financial support in order to cover necessities. Other responses included the need for financial support for dinners or travel, along with financial assistance and help managing the costs associated with pediatric cancer. Many parents reported that their work was impacted by their child's diagnosis. Some parents described an unmet need for paid time off, lost hours at work, or feeling a lack of balance around work life. For example, one response said, "I lost my job due to needing time off to tend to this," showing how impactful the diagnosis could be on someone's work life.
Finally, parents noted the effect their child's cancer had on their household budgets. In some cases, their struggles were alleviated by support. These financial hardships originate from costs related to treatment, costs put toward travel due to the cancer diagnosis, bills, and insurance. As one respondent reported, "In order to keep my child with health insurance, I struggle with paying my bills." This portrays the effect that cancer-related costs have on one's ability to keep up with basic finances.

Conclusion: This study found that many families dealing with pediatric cancer encounter new obstacles related to work, outside costs, and financial support. This highlights an opportunity for cancer centers to develop novel and effective strategies to mitigate the financial burden experienced by pediatric cancer caregivers. In addition, these findings indicate a need for additional research into the financial struggles experienced by the families of pediatric cancer patients.

30. An Analysis of the Relationship Between Female Faculty and Female Resident Representation in Neurosurgery Residency Programs

Megan D. Malueg BS, Hayden E. Greene MD MS, Renée M. Reynolds MD

Department of Surgery, Department of Neurosurgery

Background: Promoting minorities within medical specialties has been postulated to be crucial to patient care and recruitment of diverse candidates. This concept has been suspected but not formally studied in the minority of women faculty and trainees in neurosurgery. We aimed to quantitatively investigate the postulated correlation relative to female representation in neurosurgery.

Methods: Data obtained from accredited neurosurgery residency programs were reviewed. Data describing the percentage of female residents and 6 demographic and 14 program-specific variables were collected. All program websites were reviewed to assess percentages of female faculty and visible commitment to diversity in applicants, evident through communicated policies, statements, or initiatives. Included programs were defined as "low" or "high" percentage of female residents or faculty relative to the grouped median value for both categories; groups were assessed for significant differences. Percentages of female faculty and residents and program-communicated diversity initiatives were investigated for significant correlation.

Results: Female faculty and diversity data were available at 117 program sites; 81 programs reported female resident percentages. Analysis revealed a significant positive correlation between female faculty and female resident percentages. Programs with higher female resident percentages had higher levels of diversity in terms of race and ethnicity. No significant correlation was found between the percentage of female faculty or residents and a communicated diversity initiative.

Conclusion: This study of current female representation in neurosurgery revealed a previously undocumented positive correlation between percentages of female faculty and female trainees. These data suggest a modifiable barrier to female entry into neurosurgical residency programs.

Presenter: Hayden Greene (Resident)

31. Barriers to Longitudinal Community Service in Medical Education

Cordero, Gaby, BS; Rafah, Sefati, BS; Lenyo, Julie MPH; L'Huillier, Joseph, MD; Bhinder, Jasmine, MD; Kelly III, William, MD; Lutfy, Jenna, BS; DiVasta, Alexandra, BS; Sanderson, Melinda, MBA; Lukan, James, MD; Lamb, Michael, PhD

M4, expected 2024, University at Buffalo, University at Buffalo, University at Buffalo, PGY3, expected 2027, General Surgery, University at Buffalo, PGY5, expected 2024, General Surgery, University at Buffalo, PGY2, expected 2027, General Surgery, University at Buffalo, M3, expected 2025, University at Buffalo, M3, expected 2025, University at Buffalo, NYS Mentoring Program, University at Buffalo, University at Buffalo

Department: Department of Surgery, University at Buffalo
Location of study: Buffalo Public Schools, Buffalo, NY

Introduction: Addressing the pervasive power imbalance between physicians and patients is crucial for improving healthcare outcomes. While medical education has increasingly incorporated health advocacy into curricula, practical implementation remains challenging due to time and resource constraints. Community service provides an opportunity to put theory into practice, but its implementation and impact remain poorly documented.

Methods: Recognizing the need for healthcare trainees to engage with communities beyond clinical settings, we explored the impact of a longitudinal mentoring program bridging medical students, general surgery residents, and schoolchildren in the public school system. Contrasting traditional episodic community engagement, our approach emphasized sustained weekly interactions throughout 8-months of the academic year, fostering consistency and trust. Medical students volunteered an hour weekly based on interest and availability, while residents had a protected weekly hour during their educational day for voluntary participation. Feasibility and participation barriers were assessed using attendance sheets and surveys.

Results: Surgical residents demonstrated higher initial interest (77%; 40/52) than preclinical medical students (15%; 56/372). No clinical medical students participated. Preliminary findings revealed medical students exhibited higher sustained commitment with 88% attendance vs. 41% of residents over the first month. Both groups experienced a gradual attendance decline over three months. Findings indicate a notable difference between preclinical and clinical-year medical students. Additionally, survey responses identified scheduling conflicts as the primary participation barrier for both medical students and general surgery residents. This was followed by assignment completion/exams, time or day of mentoring sessions, and distance to the mentoring site.

Discussion: This study provides insight into the challenges of integrating longitudinal community engagement into medical training. It establishes a foundation for refining curriculum structures, encouraging long-term commitment, and fostering connections between healthcare professionals and the communities they serve.

32. The Validity of Frailty Scoring in Preoperative Risk Assessment for Patients in the Surgical Intensive Care Unit

Chloe McQuestion B.S, Madison Ballacchino B.S, Jason Gershgorn B.S, Csaba Gajdos M.D, Nader Nader M.D., Ph.D.

State University Of New York At Buffalo, Department of Surgery, Buffalo, NY, USA
State University Of New York At Buffalo, Department of Anesthesiology, Buffalo, NY, USA

Background: Frailty is a term used to classify patients' physiologic reserve to perform daily activities and overcome external stressors impacting their physical health. The National Surgical Office at the Buffalo Veterans Affairs incorporated a screening tool known as the Risk Analysis Index (RAI) to assess a patient's frailty level. RAI has been used to identify patients at an increased risk of adverse events following surgical procedures. We aimed to examine the validity of RAI scores in predicting early perioperative mortality and the occurrence of adverse events in patients admitted to a surgical intensive care unit (SICU).

Methods: We accessed the list of patients admitted to the SICU and calculated their RAI scores on admission using the VA online tool. This calculator uses age, sex, comorbid conditions, cognition, and the ability of patients to perform their daily activities without help. The primary endpoint used for calculating the cutoff value of RAI was 30-day mortality, and the secondary endpoints included overall mortality and the duration of SICU stay. Receiver operator characteristics were used to calculate the cutoff value for RAI, and based on that, patients were categorized as "high" or "low" RAI groups. The frequency of adverse events and survival analyses were examined by chi-square and Kaplan-Meier tests. Null hypotheses were rejected if $P<0.05$,

Results: 535 patients were reviewed. RAI scoring was a strong predictor (AUC 0.792 ± 0.012) of 30-day mortality, and with a cutoff value of 33.5, its sensitivity was 87.9%, and specificity was 56.6%. The high-RAI group had greater early and late mortality rates than the low-RAI group (Figure). There was a nine-fold increase in 30-day mortality hazard risk amongst the high-RAI patients ($P<0.001$). Similarly, the risk of late mortality was a four-fold increase in the high-RAI group ($P<0.001$). However, we found no association between RAI scores and ICU or hospital length of stay.

Conclusion: This study validates using frailty scoring in predicting adverse outcomes in the SICU setting. In future studies, this tool may be compared to other available ICU risk assessment tools, such as APACHE-II and Severity Risk Index tools.

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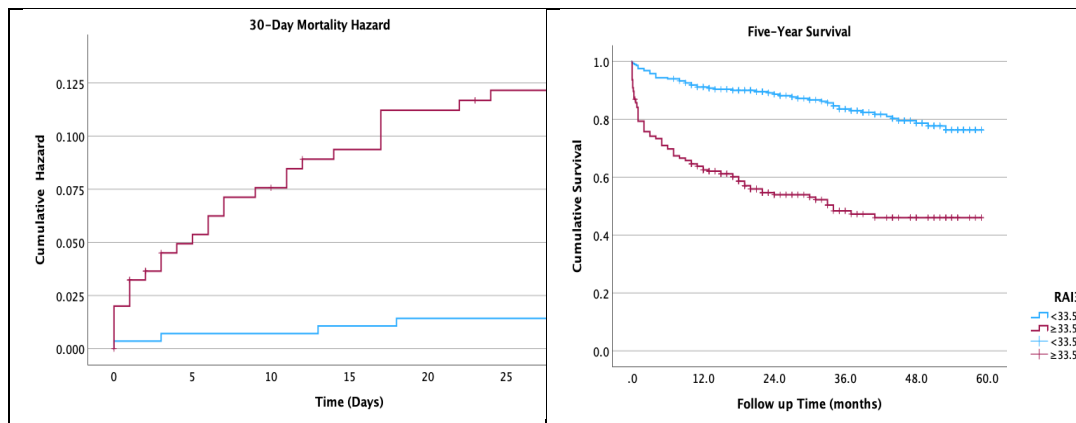
Department of Surgery

Oral Presentations

Oral Presentations

1. 9:05 – 9:17am **"Penetrance of Germline *CDH1* Variants with Implications for Management: A North American Cohort Study"**
   *Carrie E. Ryan MD, Grace-Ann Fasaye ScM, Amber F. Gallanis MD, Lauren A. Gamble MD, Paul H. McClelland MD, Anna Duemler MS, Sarah G. Samaranayake MS, Andrew M. Blakely MD, Christine M. Drogan MS, Kerry Kingham MS, Devanshi Patel MS, Linda Rodgers-Fouche MGC, Ava Siegel BS, Sonia S. Kupfer MD, James M. Ford MD, Daniel C. Chung MD, James G. Dowty PhD, Joshua Sampson PhD, Jeremy L. Davis MD

2. 9:17 – 9:29am **"The Feasibility and Implementation Of A Community Service Program In A General Surgery Training Program"**
   *Cordero, Gaby, BS; Rafah, Sefati, BS; Lenyo, Julie MPH; L'Huillier, Joseph, MD; Bhinder, Jasmine, MD; Kelly III, William, MD; Lutfy, Jenna, BS; DiVasta, Alexandra, BS; Sanderson, Melinda, MBA; Lukan, James, MD; Lamb, Michael, PhD

3. 9:29 – 9:41am **"Does Ki67 gene expression predict patient survival and response to neoadjuvant chemotherapy in ER+/HER2- breast cancer?"**
   *Kohei Chida, Rongrong Wu, Arya Mariam Roy, Li Yan, Takashi Ishikawa, Kenichi Hakamada, Kazuaki Takabe

4. 9:41 – 9:53am **"Frailty Scores with Multidisciplinary Screening Accurately Predicted the Prohibitive Surgical Risk"**
   *Chloe C. McQuestion, BS; Madison M. Ballacchino, BS, BS; Matthew S. Giuca, MD; Hasan H. Dosluoglu, MD; Linda Harris MD; Nader D. Nader, MD PhD

5. 9:53 – 10:05am **"Long Term Impact of Preemptive Non-selective Perigraft Aortic Sac Embolization During Endovascular Aneurysm Repair "**
   *Helen A Potter MD, Mariel Rivero, MD, Brittany Montross, MD, Sikandar Z Khan, MBBS, Linda M Harris, MD, Maciej L Dryjski, MD, Hasan H Dosluoglu, MD

6. 10:05 – 10:17am **"The Incidence Rate of Second Primary Cancer After Initial NSCLC Diagnosis From 2010-2014 Compared To 2015-2019 "**
   *Emily Huckell1; Leena Jalees; Kirsten Domogola; Ella Fishkin; Matthew Harshany; Alina Khan; Giacinta Murray; Kristina Vlasaty; Rene Bouchard; Adrienne Groman2; Mark Hennon, MD

7. 10:17 – 10:29am **"Gravity and Society: Geriatric Fall Recidivism and The Social Deprivation Index "**
   *Joseph C L'Huillier, MD (Resident); Joseph D Boccardoc, MS; Ajay Mynenia, MBBS, PhD, MPH; Katia Noyesb, PhD, MPH; Jihnhee Yuc, PhD; Weidun Alan Guoa, MD, PhD, FACS

8. 10:29 – 10:41am **"Percutaneous EVAR can be safely performed in over 90% of elective EVAR despite IFU recommendations"**
   *Ravirasmi Jasti MD; Monica O'Brien-Irr MS RN; Jasmine Bhinder MD; Sikander Khan MD; Linda Harris MD; Hasan H. Dosluoglu MD; Maciej Dryjski MD and Brittany Montross MD

9. 11:00 – 11:12am **"Operative Timing for Elective Thoracoscopic Lobectomy for CPAM and Sequestration: a NSQIP-Pediatric Analysis 2017-2021"**
   *John M. Woodward, MD (Res), Rhys Mendel, BS, Stephanie Brierley, MD (Res), Krystle Bittner, MPH, Hector Osei, MD, Carroll Harmon, MD, PhD, P. Benson Ham III, MD, MS

10. 11:12 – 11:24am **"Outcomes of endovascular versus surgical left subclavian artery revascularization in TEVAR involving the aortic arch"**
    *Isaac Naazie, MD, MPH; Harneet Sandhu MS3; Matthew Chang, MD; Hasan Dosluoglu, MD; Maciej Dryjski, MD, PhD; Sikandar Khan MD; Brittany Montross, MD; Linda Harris, MD

11. 11:24 – 11:36am "**Do Outcomes Following Colorectal Resection for Colorectal Cancer Differ Between Flagship and Non-Flagship Hospitals in New York State?**"
    Joseph C L'Huillier[ab], MD (Resident); Joseph D Boccardo[c], MS; *Miranda Berkebile[a], BS (Medical Student); John M Woodward[a], MD (Resident); Katia Noyes[b], PhD, MPH; Nader D Nader[d], MD, PhD, FACC, FCCP; Csaba Gajdos[a], MD, FACS, FSSO

12. 11:36 – 11:48am **"Investigating Transferability of General Large Multimodal Model ChatGPT-4-Vision to Surgical Video Domain with Minimal Training"**
    *Emily M Hannah, Garrett C Skinner, MD, Joseph L'Huillier, MD1, Steven D Schwaitzberg, MD, Gene Yang, MD, Peter CW Kim, MD, PhD

13. 11:48 – 12:00pm **"Catastrophic Health Expenditures for Colorectal Cancer Care: A Retrospective Analysis of the First Private Comprehensive Cancer Center In Lagos, Nigeria"**
    *Frankie I. Uwechue MD; Norah N. Zaza MD; Matt Caputo BS; Zainab Adegbite MPH; Chinenye Iwuji BM, PhD; Chukwumere Nwogu MD PhD; Bindiya Chugani BS; Kristina Diaz MSN, RN; Juliet S. Lumati MD, MPH

14. 12:00 – 12:12pm **"One Minute Preceptor Model: Incorporating an Interactive Didactic Session into Surgery Intern Orientation May Increase the Frequency of Medical Student Teaching"**
    *John M. Woodward, MD (Res); Joseph C. L'Huillier, MD (Res); Clairice A. Cooper, MD, MHPE, FACS

15. 12:12 – 12:24pm **"Correlating Image-Based Obesity Metrics with Metabolic Pathway Changes in Non-Small Cell Lung Cancer (NSCLC)"**
    *Akhil Goud Pachimatla MD, Yeshwanth Vedire MD, Sukumar Kalvapudi MD, Kaylan Gee MD, Hua-Hsin Hsiao, Todd Demmy MD, Spencer Rosario PhD, and Sai Yendamuri MD

16. 12:24 – 12:36pm **"The Anatomy of Gossip: Dissecting Dynamics and Impacts in Surgical Residency"**
    *Joseph C L'Huillier, MD (Resident); Caitlin Silvestrib, MD; Riley Brianc, MD, MAEd; Rebecca Morecid, MD, MS; Julie M. Clanahane, MD, MHPE; Sarah Lundf, MD; Andrea JH Williamsong, MD; Ananya Anandh, MD; Connie Gani, MD; Steven W Thorntonj, MD; John M Woodward, MD (Resident); Bobbie Ann Adair Whitek, EdD, MA

17. 12:36 – 12:48pm **"Gun violence and access to Stop the Bleed training in Western New York "**
    *William H. Kelly, MD; James K. Lukan, MD; Steven D. Schwaitzberg, MD

Oral Presentations #1-8
9:05 – 10:41am

1. Penetrance of Germline *CDH1* Variants with Implications for Management: A North American Cohort Study

Carrie E. Ryan MD, Grace-Ann Fasaye ScM, Amber F. Gallanis MD, Lauren A. Gamble MD, Paul H. McClelland MD, Anna Duemler MS, Sarah G. Samaranayake MS, Andrew M. Blakely MD, Christine M. Drogan MS, Kerry Kingham MS, Devanshi Patel MS, Linda Rodgers-Fouche MGC, Ava Siegel BS, Sonia S. Kupfer MD, James M. Ford MD, Daniel C. Chung MD, James G. Dowty PhD, Joshua Sampson PhD, Jeremy L. Davis MD

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Cancer Genetics and Genomics, Stanford University, Stanford, CA
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Centre for Epidemiology and Biostatistics, University of Melbourne, Melbourne, Australia
Division of Cancer Epidemiology and Genetics, National Cancer Institute, National Institutes of Health, Bethesda, MD

Background:
Hereditary diffuse gastric cancer and lobular breast cancer are most often caused by germline loss-of-function *CDH1* variants. Previous estimates of lifetime cancer risk exceeded 50% and have influenced clinical management for two decades. We undertook this study to establish gastric and breast cancer risk estimates for individuals with *CDH1* variants.

Methods:
We identified 213 families from North America with a pathogenic or likely pathogenic (P/LP) *CDH1* variant in ≥1 member. Hazard ratios (HRs), defined as risk in variant carriers relative to non-carriers, were estimated for each cancer type and used to calculate cumulative risks and risks per decade of life.

Results:
Among the 213 families there were 7,323 individuals, of whom, 883 had a confirmed *CDH1* P/LP variant. The prevalence of gastric cancer was 13.9% (123/883) and female breast cancer was 26.3% (144/547) in *CDH1* variant carriers. The estimated HR for gastric cancer was 33.5 (95% CI = 9.8-112) at age 30 and 3.5 (95% CI = 0.4-30.3) at age 70. The penetrance (cumulative risk) of gastric cancer in male and female carriers was 10% (95% CI = 6-24%) and 7% (95% CI = 4-15%), respectively. Gastric cancer risk estimates based on family history indicated that a carrier with 3 affected first-degree relatives can have a penetrance of 38% (95% CI=25-64%) because of other risk factors that are correlated within families. The HR for female breast cancer was 5.7 (95% CI = 2.5-13.2) at age 30 and 3.9 (95% CI = 1.1-13.7) at age 70. The penetrance of female breast cancer was 37% (95% CI = 26-63%).

Conclusions:
Gastric cancer risk is considerably lower than originally described for individuals with germline *CDH1* P/LP variants, whereas breast cancer risk remains elevated. Revised estimates with stratification of cancer risk should be incorporated into guidelines for individualized cancer risk management.

2. The Feasibility and Implementation of a Community Service Program in a General Surgery Training Program

Cordero, Gaby, BS; Rafah, Sefati, BS; Lenyo, Julie MPH; L'Huillier, Joseph, MD; Bhinder, Jasmine, MD; Kelly III, William, MD; Lutfy, Jenna, BS; DiVasta, Alexandra, BS; Sanderson, Melinda, MBA; Lukan, James, MD, Lamb, Michael, PhD

M4, expected 2024, University at Buffalo, University at Buffalo, University at Buffalo, PGY3, expected 2027, General Surgery, University at Buffalo, PGY5, expected 2024, General Surgery, University at Buffalo, PGY2, expected 2027, General Surgery, University at Buffalo, M3, expected 2025, University at Buffalo, M3, expected 2025, University at Buffalo, NYS Mentoring Program, University at Buffalo, University at Buffalo

Department: Department of Surgery, University at Buffalo
Location of Study: Buffalo Public Schools, Buffalo, NY

Introduction: Racial and socioeconomic disparities persist in the United States contributing to a lack of trust in the healthcare system, impacting health outcomes within marginalized communities. Rebuilding trust requires physicians to acquire the knowledge, understanding, and interpersonal skills necessary to provide equitable patient care, an integral component of Accreditation Council for Graduate Medical Education competencies. Incorporating these skills into surgical residency training programs poses challenges due to their complexity and the time commitment required from trainees.

Methods: We implemented a 6-week pilot program integrating a weekly optional community service mentorship hour with public school children into the academic morning of general surgery residents. We collected attendance and distributed a survey that was administered at the end of the experience to assess mentor retention rates, participation barriers, and the overall feasibility of incorporating such programs into residents' schedules.

Results: 73% of eligible residents participated and attended at least one mentorship session with 16% of those participants attending all sessions. Residents overwhelmingly reported positive impacts on their understanding of the local community, their educational experience, and confidence in providing equitable care. Importantly, residents did not report a decrease in completed surgical cases attributable to their participation in the mentorship program. Lower PGY levels exhibited the best attendance rates. The most frequently cited participation barrier was work-related absences, particularly working night shifts. Other barriers to attendance included vacation days, sick leave, medical appointments, and other personal commitments.

Discussion: This initial evaluation demonstrates the feasibility of longitudinal weekly community service engagement for surgery residents. Factors influencing participation including site distance, faculty support, and potential apprehension about not attending program-deemed beneficial activities warrant further investigation. We aim to develop a comprehensive plan addressing these factors to enhance resident participation and retention in community initiatives and optimize the impact of this engagement on surgical training.

3. Does Ki67 gene expression predict patient survival and response to neoadjuvant chemotherapy in ER+/HER2- breast cancer?

Kohei Chida, Rongrong Wu, Arya Mariam Roy, Li Yan, Takashi Ishikawa, Kenichi Hakamada, Kazuaki Takabe

Department of Surgical Oncology, Roswell Park Comprehensive Cancer Center

Introduction: Highly proliferative cancers tend to exhibit better response to neoadjuvant chemotherapy (NAC), and pathological complete response (pCR) is a recognized surrogate for improved survival outcomes. Recently Ki67, a widely used cell proliferation marker assessed by immunostaining, has been proposed as a marker for lymph nodal downstaging after NAC. However, conventional immunostaining is susceptible to variability influenced by the assessor and the institutional factors, including the antibody used. Therefore, we hypothesized that the Ki67 gene (MKi67) expression identifies highly proliferative breast cancer (BC) and is associated with higher pCR rate after NAC and improved survival.

Methods: A total of 6623 ER+/HER2- BC patients from 11 independent cohorts with tumor transcriptome and clinical data were included in our analysis. Within each cohort, the top 20% of MKi67 expression was defined as the high expression group based on the previous studies using immunostaining.

Results: Consistently across TCGA, METABRIC and SCAN-B cohorts, MKi67 expression correlated with histological grade. MKi67 high ER+/HER2- was linked with high proliferation score, and it enriched all the cell proliferation-related gene sets in the Hallmark collection; E2F Targets, G2M Checkpoint, Mitotic Spindle, and Myc Targets v1 and v2. MKi67 high ER+/HER2- was associated with increased intra-tumoral heterogeneity, homologous recombination defect, fraction altered, silent and non-silent mutations, and single-nucleotide variants (SNV) neoantigens. It also exhibited higher tumor infiltrating lymphocytes, interferon (IFN)-γ response, and B-Cell Receptor and T-Cell Receptor richness, and had higher infiltration of Th1 cells, Th2 cells, M1 macrophage, regulatory T cells, B cells, and plasma cells. Conversely, MKi67 low ER+/HER2- enriched gene sets related to Hypoxia, Epithelial-to-Mesenchymal Transition, KRAS-signaling, and Coagulation. We observed that MKi67 high ER+/HER2- was significantly associated with better pCR rate in six of the eight neoadjuvant chemotherapy cohorts. However, MKi67 high ER+/HER2- was significantly associated with worse disease-free, disease-specific, and overall survival consistently in METABRIC, and showed a worse overall survival in TCGA and SCAN-B cohorts.

Conclusion: Highly proliferative ER+/HER2- BC, identified by elevated MKi67 expression, was significantly associated with increased pCR after NAC but was also linked to poorer survival.
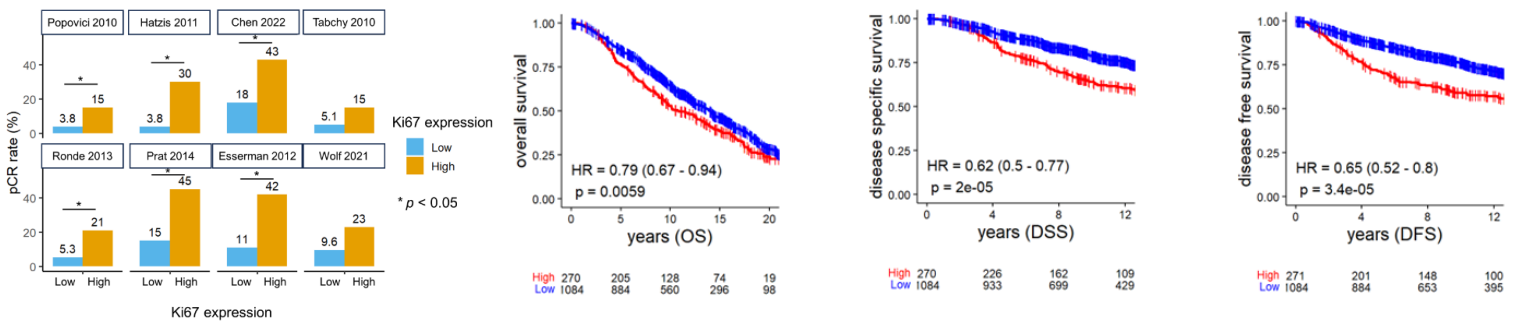
4. Frailty Scores with Multidisciplinary Screening Accurately Predicted the Prohibitive Surgical Risk

Chloe C. McQuestion, BS; Madison M. Ballacchino, BS, BS; Matthew S. Giuca, MD; Hasan H. Dosluoglu, MD; Linda Harris MD; Nader D. Nader, MD PhD

State University Of New York At Buffalo, Surgery, Buffalo, NY, USA
State University Of New York At Buffalo, Anesthesiology, Buffalo, NY, USA

Background: Frail patients could benefit from preoperative multi-disciplinary surgical pause committees (MDSPC) when utilizing risk-benefit ratios for the proposed surgical plan. We examined whether MDSPCs improved clinical outcomes by developing individualized care plans and stratifying patients based on their level of frailty and ability to overcome external stressors. Our study aims to examine the role of MDSPCs in perioperative planning to reduce adverse postoperative events and mortality rates. Our study further evaluates the usefulness of frailty scoring in predicting adverse outcomes as well as serving as a selection criterion for which patients would benefit most from an MDSPC.

Methods: We retrospectively collected information from all patients who had received an MDSPC evaluation between 10/2011 to 04/2023 in the Veterans Affairs WNYHCS. Patient demographics and clinical presentation with early and late follow-up data were collected. RAI scores using the VA frailty screening tool were also calculated retrospectively. MDSPCs plans were put into the following categories: proceed with the planned surgery (G1), proceed after medical optimization (G2), reduce invasiveness of surgery or anesthesia plan (G3), or adopt a non-surgical approach (G4). Chi-square and independent t-tests were used for categorical and numerical data, respectively. Survival analysis for 30-day (primary endpoint), one-year, and overall mortality rates used Kaplan-Meier. The alpha was set at 0.05.

Results: A total of 394 patients (382 male) were included (mean age 71 ± 11 years). ASA class III and IV comprised 87.3%. The RAI scores were 36.4 ± 9.6 in G1, 37.4 ± 10.8 in G2, 41.4 ± 9.3 in G3 and 44.2 ± 9.7 in G4 (p<.001, G1/G2 vs G3/G4). The RAI cutoff value for patients with a prohibited surgical approach was 40.5. 30-day mortality was 6.6% in G1, 8.2% in G2, 10.64% in G3 and 19.8% in G4 (p<0.002) Mean survival was 35 months in G1, 35 months in G2, 20 months in G3 and 18 months in G4 (p<.001, G1/G2 vs G3/G4, Figure).
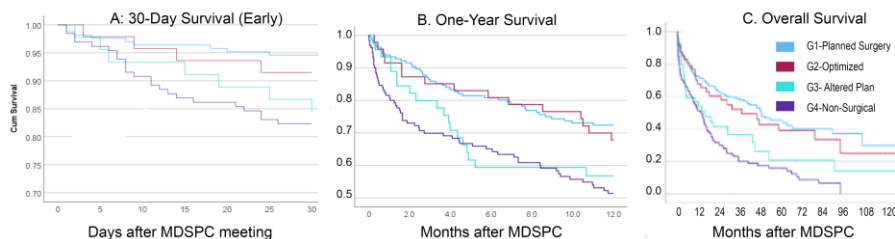
Conclusion: Detailed clinical assessment by MDSPC is efficient for correctly identifying patients with an elevated risk of fatality following surgical patients, and the RAI tool is beneficial in screening the high-risk patients to be evaluated and possibly identifying those with prohibitive surgical risk. Medical optimization improved overall survival and reduced death within 30 days and one year to be comparable to G1. Additionally, reducing the surgical invasiveness only improved survival advantage for six months, after which it was comparable to those in G4 with the worst outcome. RAI scoring is an excellent tool to predict the outcome of surgery, and it was used successfully in critically ill patients.
Presenter: Chloe McQuestion (Medical student)

5. Long Term Impact of Preemptive Non-selective Perigraft Aortic Sac Embolization During Endovascular Aneurysm Repair

Helen A Potter MD, Mariel Rivero, MD, Brittany Montross, MD, Sikandar Z Khan, MBBS, Linda M Harris, MD, Maciej L Dryjski, MD, Hasan H Dosluoglu, MD

Vascular Surgery Fellow, Division of Vascular Surgery, Department of Surgery, University at Buffalo

Objective: Preemptive non-selective perigraft aortic sac embolization with coils (PNPASEC) in patients at high risk of developing type 2 endoleaks (T2EL) has been reported to decrease T2ELs, endoleak-related reinterventions. Likewise, sac size increase or stability has been reported to be associated with endoleaks, reinterventions and even mortality. The goal of this study is to see the long-term impact of PNPASEC on sac behavior, endoleaks, reinterventions, and survival in patients with high risk for T2EL.

Methods: 334 patients undergoing elective endovascular aneurysm repair (EVAR) from 1/1/2007 – 4/30/22 who had preoperative contrast computerized tomography (CT) and at least one imaging study at 6 months were included. High risk for T2EL was defined as ≥ 4 patent lumbar arteries (LA), patent inferior mesenteric artery (IMA) ≥3mm and ≥ 30mm aortic lumen. Survival, endoleak-free survival (EFS), T2EL/endotension-free survival, reintervention-free survival and sac diameter changes over time were compared between patients not high risk for T2EL (Group I, N=203), those who were high risk and underwent PNPASEC (Group II, N=60) and those who met the criteria but did not have PNPASEC (Group III, N=71).

Results: The groups were similar except for coronary artery disease being more prevalent in Group I (50.2%) than in Groups II (36.7%) and III (35.2%, P=0.035). Overall follow-up was 72.6±40.1 months, imaging follow-up was 60.6±38.9 months, significantly less in Group II (54.6±32.0 and 46.2±31.0months) vs I or III (P<0.001). During last follow up, the sac size decrease was similar in Group I (-1.2±1.1cm) and II (-1.4±1.2cm), both of which were significantly more than Group III (-0.6±2.1cm, P<0.013). During last follow up, 85% in Group II had sac decrease, compared to 58% in Group III (P<0.001), and 7% in Group II had sac increase during follow up vs 27% in Group III (P=0.005). Overall survival was similar in all groups, whereas endoleak-free survival, endoleak-related intervention-free survival. T2EL-free survival, and T2EL-related reintervention-free survival were significantly better in Groups I and II than Group III.

Conclusions: PNPASEC in patients at high risk for T2EL results in less T2EL and associated reinterventions in long term, at a rate similar to those with low risk for T2EL and is more likely to result in sac size decrease.

6. The Incidence Rate of Second Primary Cancer After Initial NSCLC Diagnosis From 2010-2014 Compared to 2015-2019

Emily Huckell; Leena Jalees; Kirsten Domogola; Ella Fishkin; Matthew Harshany; Alina Khan; Giacinta Murray; Kristina Vlasaty; Rene Bouchard; Adrienne Groman; Mark Hennon, MD

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Objective: Non-small cell lung cancer (NSCLC) is the second most common cancer globally, and as NSCLC survival rates improve, risk of secondary primary cancer (SPC) after NSCLC grows more prevalent. Early detection has been shown to improve mortality rates of NSCLC. Screening eligibility has changed since 2015, when Medicare & Medicaid Services began covering LDCT (low-dose computed tomography) scans for high-risk patients and screening criteria broadened the age range and pack-year requirements. Little is known about the incidence of SPC after an initial NSCLC diagnosis since the screening guidelines changed. To address this gap, this study seeks to compare the incidence rates and overall survival of SPC after NSCLC of patients diagnosed between 2010-2014 and 2015-2019.

Methods: Using the SEER database, NSCLC patients diagnosed between 2010 and 2019 who subsequently developed an SPC were retrospectively analyzed. Patients were divided into two groups by date of initial NSCLC diagnosis (2010-2014 and 2015-2019). The incidence rate and overall survival (OS) in these two groups were analyzed through the Cox proportional hazards regression modeling of univariate and multivariate analysis.

Results: As seen in Figure 1a, the incidence rate for SPC following NSCLC diagnosis increased significantly between 2010-2014 and 2015-2019. The cohort of 8,424 patients diagnosed from 2010-2014 had an incidence rate of 0.54 per 100,000 individuals, while the second cohort of 9,949 patients diagnosed from 2015-2019 had an average SPC incidence rate of 0.61 per 100,000 individuals. The overall survival of NSCLC patients following SPC significantly improved in the latter time period, as shown in Figure 1b.

Discussion: Incidence of SPC after NSCLC increased from 2010-2014 to 2015-2019 after screening eligibility was changed and access to LDCT scanning increased. Meanwhile, OS of NSCLC patients with SPC improved in more recent years. While increased access to screening seems to improve the OS of NSCLC patients, it also seems to raise the risk of developing SPC.
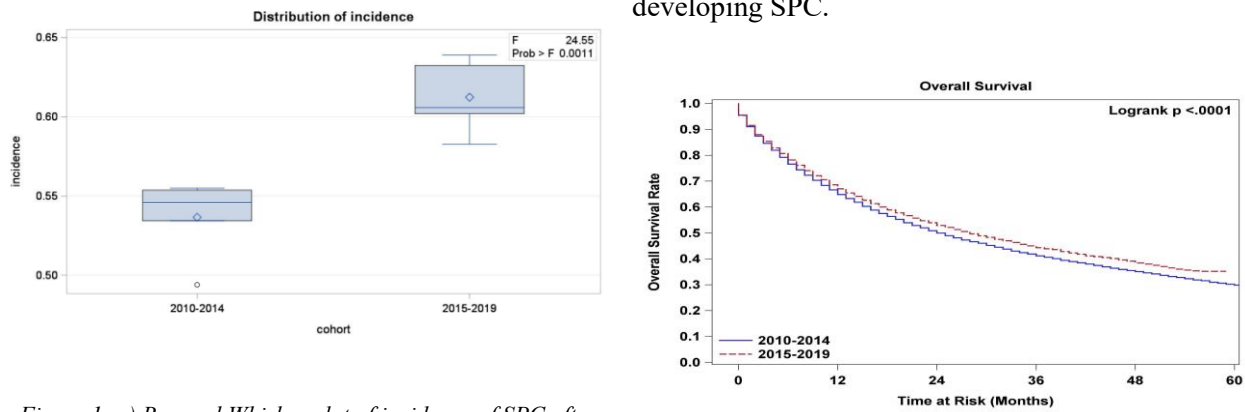

Figure 1: a) Box and Whisker plot of incidence of SPC after NSCLC by date of diagnosis; b) Multivariate survival curves for patients diagnosed with SPC after NSCLC from years 2010-2014 and 2015-2019

7.   Gravity and Society: Geriatric Fall Recidivism and The Social Deprivation Index

Joseph C L'Huillier, MD (Resident); Joseph D Boccardo, MS; Ajay Myneni, MBBS, PhD, MPH; Katia Noyes, PhD, MPH; Jihnhee Yu, PhD; Weidun Alan Guo, MD, PhD, FACS

University at Buffalo Departments of: Surgery; Epidemiology and Environmental Health, Division of Health Services, Policy, and Practice; Biostatistics

Background: Falls are the most common cause of trauma among geriatric adults. Subsequent fall risk escalates after an initial incident. While an area's Social Deprivation Index (SDI) impacts population trauma outcomes, its impact on fall recidivism remains unknown. We hypothesized that living in worse/higher SDI zip codes would be associated with increased risk of fall recidivism.

Methods: Analysis of the New York State hospital discharge database (SPARCS, 2005-2020) included patients aged $\geq$ 65 with an ED visit $\pm$ inpatient admission for a fall, excluding initial fall deaths. Patients were stratified into those who had single or multiple falls ("recidivism," $\geq$ 30 days apart) during the study period. Demographics and environmental factors including SDI of patients' home zip codes at time of first fall were compared between groups.

Results: Out of 1,579,595 patients, 1,169,936 (74.1%) experienced a single fall, while 409,659 (25.9%) suffered fall recidivism. On bivariate analysis, those suffering fall recidivism were more likely to be White (82.2% vs 74.8%, $p < 0.01$), have Medicare insurance (86.3% vs 82.3%, $p < 0.01$), and live in zip codes with better/lower SDI (49th vs 53rd percentile, $p < 0.01$). Bivariate comparison of SDI components by group is shown in Table (all $p < 0.01$). On multivariate regression, older age at first fall (OR 1.012) and female sex (OR 1.192) were associated with an increased risk of fall recidivism. Black race (OR 0.594), non-White/non-Black race (OR 0.669), further distance from home to the hospital (OR 0.996), and worse/higher home zip code SDI (OR 0.999) were associated with a decreased risk of fall recidivism (all $p < 0.01$).

Conclusion: At least a quarter of geriatric patients who fall experience fall recidivism. White race, Medicare insurance, and better/lower SDI zip codes are associated with increased risk of fall recidivism. Although data are limited to only patients who sought care for repeat falls, our study suggests that disparities exist regarding geriatric falls. Patients in areas with worse/higher SDI may not be able to seek care for additional falls due to socioeconomic limitations. Educating all fall patients about the risk of suffering repeat falls is paramount. Ongoing research will attempt to discern whether patients living in worse/higher SDI areas are experiencing fewer repeat falls or simply not seeking care for them. Furthermore, additional factors such as patient income and social support will be analyzed.

SDI Components (% ± SD)	One Fall (n = 1,169,936)	Fall Recidivism (n = 409,659)	*p*-value
Pop at federal poverty level	13.0 ± 9	12.3 ± 9	<0.01
Single parent families with dependents aged <18	12.9 ± 8	12.5 ± 8	<0.01
Pop aged ≥ 25 & < 12 years education	12.1 ± 8	11.3 ± 8	<0.01
Unemployed for pop age 16-64	29.3 ± 7	29.0 ± 7	<0.01
Households w/o a vehicle	24.6 ± 25	21.2 ± 23	<0.01
Living in rented units	41.8 ± 24	38.7 ± 23	<0.01
Living in crowded housing	4.6 ± 5	3.9 ± 5	<0.01

8. Percutaneous EVAR can be safely performed in over 90% of elective EVAR despite IFU recommendations

Ravirasmi Jasti MD; Monica O'Brien-Irr MS RN; Jasmine Bhinder MD; Sikander Khan MD; Linda Harris MD; Hasan H. Dosluoglu MD; Maciej Dryjski MD and Brittany Montross MD

Division of Vascular Surgery, Department of Surgery

Objective: Evaluate outcomes following endovascular repair of abdominal aortic aneurysm and impact of IFU compliance among those closed percutaneously (PEVAR).

Methods: Retrospective 10-year (2012-2021) review of elective abdominal aortic aneurysms (AAA) at tertiary care hospital. Demographics, comorbidities, procedural data, length of stay, and Proglide^{TM} IFU compliance were collected. Groups were compared based on intention to treat (ITT), actual closure status, PEVAR success and time-period, early:(2012-2016)/late:(2017-2021) using Chi Sq, Anova, Student T test and regression analysis. Significance level P < .05

Results: There were 558 EVARs: 287 early/271 late. ITT groups: bilateral PEVAR; 509 (91.2%), single sided PEVAR with planned contralateral cut-down (SS) 21 (3.8%), single sided- tube graft 6(1.1%) and planned bilateral cutdown (PBC) 22(3.9%). Mean age 73.5 $\pm$ 8.8, 427 (77%) male.
PBC declined from early to late (4.5% vs. 3.3%; P= .03). PEVAR was successful in 95.7% (1000/1045 arteries). Failure requiring cutdown occurred in 45(4.3%) arteries and declined from early to late (5.9% vs. 2.3; P = .013). Blood loss <350 occurred in 12 failures (1.2%) requiring direct arterial repair only; while 22 (2.1%) required adjunctive procedures; 12(1.2%) for limb ischemia; RTOR was 5(0.5%). Blood loss $\geq$350 ml occurred in 22(4.1%); 15(2.8%) required transfusion. Failed PEVAR were more often transfused than PBC (37.5% vs. 13.6%; P= .048) despite similar EBL: (545 ml vs.348 ml: P=.13). PBC operative time (296 $\pm$ 133) was longer than Successful PEVAR:(159 $\pm$ 54; P.001); but similar to Failed PEVAR (261 $\pm$ 96; P = .23). PEVAR were more likely discharged POD #1, (Successful 84.3%, Unsuccessful 50% vs. BPC 13.6%; P <.001.) Proglide was used in 95% of PEVARS (995/1045 arteries); and performed outside of IFU in 16%. Two IFU criteria (CFA calcification < 50% and CFA access) independently predicted success. Specificity and NPV were excellent but Sensitivity and PPV were poor - moderate. Male gender was also an independent predictor of success: Exp (B) .36(.18 -.75); P= .006

Conclusions: Bilateral PEVAR can be completed in > 90% of EVAR with excellent success, shorter operative times and reduced LOS. Most IFU criteria had no impact on success. CFA calcification < 50% and CFA access accurately predicted PEVAR success. These results are particularly relevant given nationally only 30% of EVARs are being completed percutaneously bilaterally. However, positive findings lacked sensitivity to predict failure. Strict adherence would disqualify arteries that could successfully undergo PEVAR. Bilateral PEVAR should be considered more widely particularly in males.

Oral Presentations #9-17
10:52 – 12:45pm

9. Operative Timing for Elective Thoracoscopic Lobectomy for CPAM and Sequestration: a NSQIP-Pediatric Analysis 2017-2021

John M. Woodward, MD (Res), Rhys Mendel, BS, Stephanie Brierley, MD (Res), Krystle Bittner, MPH, Hector Osei, MD, Carroll Harmon, MD, PhD, P. Benson Ham III, MD, MS

Division of Pediatric Surgery, Oishei Children's Hospital

Introduction: Literature on optimal timing for elective thoracoscopic lobectomy for congenital pulmonary airway malformations (CPAM) and sequestration has been single center or with broader focus of diagnoses. By specifying our analysis, we aim to assess optimal operative timing for elective thoracoscopic lobectomy for CPAM and sequestration.

Methods: Data from the ACS NSQIP-P registry was used to evaluate elective thoracoscopic lobectomy patients from 2017-2021 diagnosed with congenital cystic lung or sequestration. Open lobectomy, ventilator dependent, oxygen dependent, and <1 month old patients were excluded. Clinical characteristics and outcomes were compared for age cohorts (in months): 1-3, 3-6, 6-9, 9-12, 12-24, and 24+.

Results: There were 717 patients identified. Operative time significantly increased with age from 1-3 months to 24+ month category (164.9 min to 221.7 min, p=0.014). Rates of conversion to open also increased; however, the trend was not significant (7.4% to 21.8%, p=0.181). There were greater transfusion events reported at 1-3 months (14.8%) which trended down at 3-6 months continuing to 24+ months (6.4% to 1.3%, p=0.067). There were no significant differences between age groups for 30-day unplanned readmission, reoperation, non-transfusion complications, all complications, or mortality (Table 1).

Conclusion: Optimal surgical timing for thoracoscopic lobectomy for CPAM and sequestration is complex. Surgery at younger ages is associated with significantly faster operative times and lower rates of conversion to open (although non-significant); however, a greater powered study is needed to verify that the bleeding and transfusion rate is not significantly higher before recommending surgery prior to 3 months of age.

Table 1: Clinical Characteristics and Outcome Differences between 1–3 month, 3-6 month, 6-9 month, 9-12 month, 12-24 month, and 24+ month Cohorts for Elective Thoracoscopic Lobectomy for CPAM and Sequestration

Clinical Characteristics and Outcomes	1-3 mo (n=27)	3-6 mo (n=204)	6-9 mo (n=191)	9-12 mo (n=104)	12-24mo (n=113)	24+ mo (n=78)	p-value
Age (months), mean (SD)	2.46 (0.47)	4.70 (0.80)	7.35 (0.88)	10.18 (0.88)	16.30 (3.26)	78.77 (54.00)	<0.001
Heme Dx	0	1 (0.5%)	1 (0.5%)	1 (0.1%)	0	2 (2.6%)	0.435
Operative Time (min), mean (SD)	164.9 (60.8)	187.1 (81.3)	184.1 (96.7)	195.8 (75.7)	191.4 (78.2)	221.7 (102.5)	0.014
Post-Op Stay (days), mean (SD)	3.33 (3.58)	2.98 (2.53)	2.53 (1.94)	3.21 (2.97)	2.94 (2.16)	4.21 (4.20)	<0.001
Laparoscopic Converted to Open	2 (7.4%)	23 (11.3%)	27 (14.1%)	16 (15.4%)	11 (9.7%)	17 (21.8%)	0.181
Post-Op Pneumonia	0	4 (2.0%)	3 (1.6%)	1 (0.1%)	1 (0.9%)	1 (1.3%)	0.983
Transfusion Events	4 (14.8%)	13 (6.4%)	10 (5.2%)	3 (2.8%)	3 (2.7%)	1 (1.3%)	0.067
Transfusion (ml/kg), mean (SD)	20.2 (11.6)	16.2 (8.8)	19.3 (8.4)	16.3 (7.0)	19.8 (17.7)	15.34 (NA)	0.952
Readmission (30-d)	1 (3.7%)	13 (6.4%)	15 (7.9%)	4 (3.8%)	6 (5.3%)	3 (3.8%)	0.775
Reoperation (30-d)	1 (3.7%)	7 (3.4%)	13 (6.8%)	2 (1.9%)	4 (3.5%)	6 (7.7%)	0.264
Non-Bleeding Complications[*]	3 (11.1%)	19 (9.3%)	24 (12.6%)	8 (7.7%)	11 (9.7%)	7 (9.0%)	0.823
Complications[*]	7 (25.9%)	28 (13.7%)	29 (15.2%)	11 (10.6%)	14 (12.4%)	8 (10.3%)	0.382
Mortality	0	0	0	0	0	0	NA

*Complications Defined as 30-day Mortality, Readmission, Reoperation, Transfusion, Septic Shock, Sepsis, Cardiac Arrest, Unplanned Intubation, Pneumonia, Organ Space infections

10. Outcomes of endovascular versus surgical left subclavian artery revascularization in TEVAR involving the aortic arch

Isaac Naazie, MD, MPH; Harneet Sandhu MS; Matthew Chang, MD; Hasan Dosluoglu, MD; Maciej Dryjski, MD, PhD; Sikandar Khan MD; Brittany Montross, MD; Linda Harris, MD

Division of Vascular and Endovascular Surgery

Background: Left subclavian artery (LSA) revascularization is recommended for TEVARs that require LSA coverage to achieve adequate seal. The aim of this study is to elucidate the comparative effectiveness of endovascular techniques versus surgical methods for LSA revascularization.

Methods: The vascular quality initiative (VQI) was queried for patients undergoing TEVAR involving the arch from August 2014 to November 2023. Procedures for descending thoracic aortic aneurysms (DTAA) and type B aortic dissections (TBAD) were included. Endovascular LSA revascularization techniques (stents, stent-grafts, chimneys, fenestrations, stented fenestrations, fenestrated branch, side-arm branched device) and surgical LSA revascularization were compared with respect to 30-day mortality, stroke, stroke or death, spinal cord ischemia, perioperative and 1-year reinterventions, and 1-year survival using both univariate analysis and multivariable analysis controlling for potential confounders

Results: A total of 967 procedures done for DTAA and TBAD qualified for inclusion within the period of the study. In 69.6% (n=673) of TEVARs involving the arch, LSA revascularization was achieved with a surgical procedure and the rest by endovascular techniques. Comparing surgical to endovascular LSA revascularization, there were no differences in 30-day mortality (3.9% vs 2.7%; OR, 1.56; 95%CI, 0.69-3.57), stroke (4.0% vs 4.4%; OR 0.8; 95%CI, 0.40-1.60; P=0.528), stroke or death (7.3% vs 5.4%; OR, 1.27; 95% CI 0.70-2.31; P=0.426), SCI (3.7% vs 3.4%; OR, 1.00; 95%CI, 0.47-2.13; P=0.992), or arm ischemia (1.8% vs 0.7%, P=0.186). However, perioperative reinterventions related to the thoracic aorta or branch treatment, or direct complications of the initial procedure were higher in the surgical group compared to the endovascular group (11.5% vs 6.1%; OR, 1.85; 95%CI, 1.07-3.17, P=0.026). Predictors of perioperative

Kaplan-Meier estimates of 1-year Survival

Log rank P=0.992

Number at risk

endo	293	164	150	135	109
surgical	672	529	518	504	459

reinterventions were black race (OR,1.92; P=0.010), CAD (OR, 1.80; P=0.046) and prior aneurysm repair (OR, 1.75, P=0.030). One-year reintervention rates (13.5% vs 12.3%, P=0.714) and survival (88.4% vs 86.9%, P=0.992) were similar between the surgical and endovascular groups
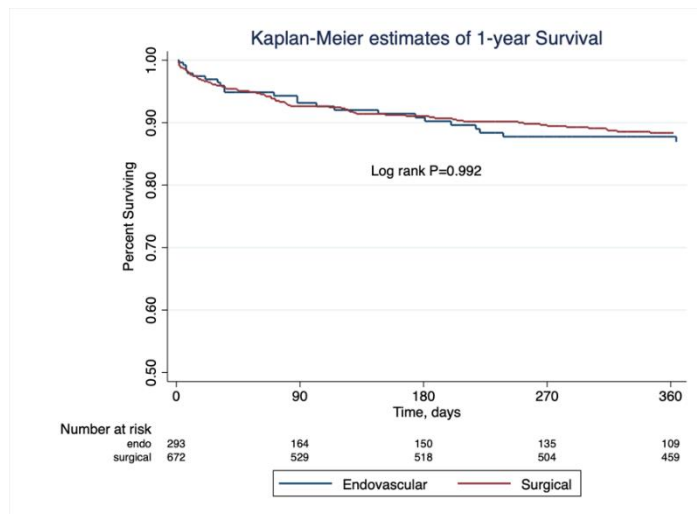
Conclusion: In this study of over 900 patients with DTAA or TBAD undergoing TEVAR that required LSA revascularization, endovascular techniques and surgical procedures were similar with regards to perioperative mortality, stroke, spinal cord ischemia, arm ischemia and 1-year survival. Perioperative aorta-related reinterventions were higher among surgical group, with black race, prior aneurysm repair and CAD being predictors. This suggests that although endovascular techniques are less often employed for LSA revascularization they may have similar outcomes compared to surgical LSA revascularization with lower rates of perioperative reinterventions.

11. Do Outcomes Following Colorectal Resection for Colorectal Cancer Differ Between Flagship and Non-Flagship Hospitals in New York State?

Joseph C L'Huillier, MD (Resident); Joseph D Boccardo, MS; Miranda Berkebile, BS (Medical Student); John M Woodward, MD (Resident); Katia Noyes, PhD, MPH; Nader D Nader, MD, PhD, FACC, FCCP; Csaba Gajdos, MD, FACS, FSSO

University at Buffalo Departments of: Surgery; Epidemiology and Environmental Health, Division of Health Services, Policy, and Practice; Biostatistics; Anesthesiology

Background: Hospitals are being merged to create large healthcare systems at a rapid pace. Whether outcomes following colorectal cancer resection at flagship hospitals vs non-flagship hospitals differ is unknown.

Methods: A 10-year (2010-2020) retrospective analysis of the New York Statewide Planning and Research Cooperative System (SPARCS) database was conducted. All adult patients with a colorectal resection for primary resectable colorectal cancer were included. Emergency cases were excluded. Patients with a secondary malignant neoplasm of the respiratory or digestive systems, a primary genital organ cancer, or urinary system cancer were excluded. A list of hospital systems in New York state was created. Within each system, the hospital with the most colorectal resections was designated the "flagship" hospital and the others were designated "non-flagship" hospitals. Patients at flagship facilities were matched with patients at their affiliated non-flagship hospitals based on gender, race, insurance, age, and Charlson Comorbidity Index. Thirty-day outcomes at flagship facilities were compared to outcomes at affiliated, non-flagship hospitals following their colorectal resection.

Results: In total, 29,995 patients were included in the study. There were 144 hospitals (31 flagship vs 113 non-flagship) that made up the 31 multi-hospital healthcare systems in New York state. Flagship facilities performed a higher proportion of procedures than non-flagship facilities on average (58.1% vs 41.9%, $p < 0.01$). Patients treated at flagship facilities were more likely to be White (73.2% vs 65.0%, $p < 0.01$) and have private insurance (31.5% vs 25.0%, $p < 0.01$). There were no differences in outcomes after matching between patients treated at flagship vs non-flagship facilities (all $p > 0.05$): mortality (0.9% vs 1.1%); surgical site infection (4.5% vs 3.7%); deep vein thrombosis (0.7% vs 1.3%); pulmonary embolism (1.5% vs 2.7%); pneumonia (2.2% vs 2.7%); urinary tract infection (4.3% vs 4.5%); acute kidney failure (3.6% vs 3.6%); myocardial infarction (0.6% vs 0.8%); post-operative hemorrhage (1.7% vs 1.9%); 30-day readmissions (10.5% vs 11.9%).
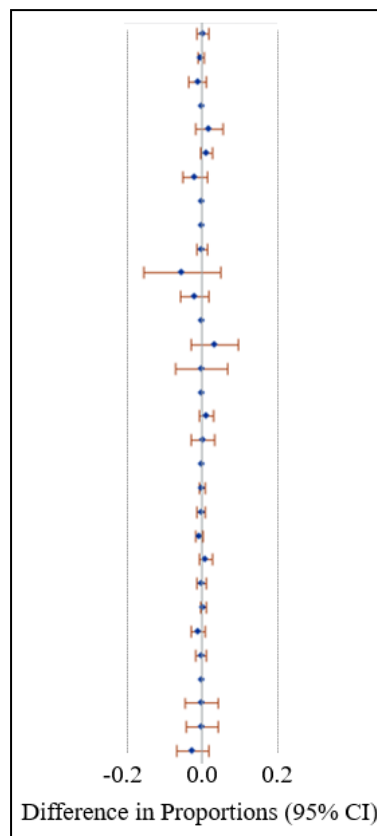

Figure: difference in 30-day mortality between patients treated at flagship vs non-flagship hospitals; each line represents one of thirty-one systems in New York State

Conclusion: Flagship hospitals and non-flagship hospitals in New York state have similar outcomes following colorectal cancer resection. Patients with resectable non-metastatic colorectal cancer may not need to undergo oncologic resection at flagship hospitals to receive high-quality perioperative care.

12. Investigating Transferability of General Large Multimodal Model ChatGPT-4-Vision to Surgical Video Domain with Minimal Training

Emily M Hannah*, Garrett C Skinner, MD*, Joseph L'Huillier, MD, Steven D Schwaitzberg, MD, Gene Yang, MD, Peter CW Kim, MD, PhD

University at Buffalo, Department of Surgery, Activ Surgical Inc., Boston MA, *co-first author

Background: Recently released ChatGPT-4-Vision (GPT-4V) by OpenAI is a generally trained large multimodal model (LMM) that can process and describe visual data in addition to text. While the role of generative artificial intelligence in surgical data science remains unclear, it promises opportunities to address the paucity of expertly curated surgical data required to train non-generative algorithms. We hypothesize that one-shot transfer learning and prompt engineering could be used to increase classification performance of laparoscopic instruments in surgical video by a non-surgical LMM using minimal training data.

Methods: Video frames (n=731) containing a single laparoscopic instrument were selected at random from the validated Cholec80 test data split. GPT-4V classification performance was first tested under zero and one-shot transfer learning conditions. Zero and one-shot means that zero and one example image of each instrument are passed to the model respectively. Next prompt engineering was done using two methodologies.
1. Self-taught in which GPT-4V was asked to visually describe each of the instruments.
2. Human-taught in which a surgical resident was asked to craft a series of conversations which simulated teaching GPT-4V how to identify and discriminate each of the seven instruments.

Performance of the model was measured using the harmonic mean of precision and recall (F1).

Results: Classification performance per instrument and learning context can be seen in Table 1. Compared to zero-shot, model performance improved for one-shot learning context by 41% (+0.11), one-shot-self-taught improved by 38% (+0.10), and one-shot-human-taught improved by 70% (+0.19).

Table 1. Classification performance of GPT-4V, measured by F1.

Learning Context	Grasper	Bipolar	Hook	Scissors	Clipper	Irrigator	SpecimenBag
zero-shot	0.34	0.10	0.36	**0.18**	0.00	0.30	0.58
one-shot	0.40	0.18	0.56	0.10	0.10	0.48	0.80
one-shot-self-taught	0.40	0.24	0.58	0.04	0.04	0.46	0.80
one-shot-human-taught	**0.46**	**0.46**	**0.60**	0.10	**0.14**	**0.54**	**0.86**

Conclusion: The opportunity of rapidly adapting an accessible, off-the-shelf general LMM to surgical tasks using minimal training data is economically appealing. Despite improvements using one-shot transfer learning and prompt engineering, overall classification of laparoscopic instruments based on overall F1 was lacking compared to fully-supervised benchmarks. Additional research should be done on methods such as altering one-shot-human-taught techniques to improve transferability of general LMMs to surgical domain specific tasks using minimal training data.

13. Catastrophic Health Expenditures for Colorectal Cancer Care: A Retrospective Analysis of the First Private Comprehensive Cancer Center In Lagos, Nigeria

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Personal Affiliation: Resident, Department of Surgery, University at Buffalo, Jacobs School of Medicine
Other Affiliations: Department of Surgery, Northwestern University Feinberg School of Medicine; Department of Oncology, Lakeshore Cancer Center, Lagos, Nigeria; Department of Surgical Oncology, Roswell Park Comprehensive Cancer Center

Introduction: Nearly a billion people worldwide risk Financial Catastrophe (FC) due to out-of-pocket (OOP) health expenditures. With low-middle income countries disproportionately impacted, and the global burden of Colorectal cancer (CRC) expected to increase 60% by 2030, Nigeria- 50% of whose 200 million strong population lives in poverty- is of interest. This study aims to evaluate the cost of treating CRC at Nigeria's first cancer center.

Methods: We queried the cancer registry for patients diagnosed with CRC between 2013-2023. Treatment costs were abstracted from bills in patient charts (adjusted to 2023 USD), as were demographic and clinical characteristics. FC was defined as OOP >20% of Nigeria's 2023 per capita GDP ($467). Two-sided Student's t-tests were used to compare total OOP by stage and cancer site ($\alpha = 0.05$).

Results: 91 patients (59% female, median age 58 , colon (n=69), rectum (n=22), 14% stage 1-2, 15% stage 3, 66% stage 4) were included. Average chemotherapy cost was $7,877 and procedure cost was $1,156. Average total cost for undergoing both procedures and adjuvant therapies was $39,333 (>80 x national GDP). Stage 3-4 patients spent $12,000 more than stages 1-2 ($p<.01$), and colon cancer care cost $9,500 more than rectal. All patients regardless of treatment modality risked FC. The greatest contributors to total cost were chemotherapy (30%) and other drugs (21%). Procedures accounted for 3%.

Total Treatment Cost Adjusted to 2023 USD				
Characteristic	**Mean(SD)**	**Financial Catastrophe n (%)**	**N**	**p-value***
Topography				
Colon	14258 (37547)	46 (67%)	69	0.052
Rectum	4737 (7954)	15 (68%)	22	
Cancer Stage				
Unknown	2554 (2345)	3 (75%)	4	
1, 2	2381 (2736)	8 (62%)	13	
3	7440 (11637)	10 (71%)	14	<.01
4	15712 (39949)	40 (67%)	60	
*T-test performed for difference of means				

Conclusion: Treatment costs for CRC are highly catastrophic. Without risk protection through insurance or financial navigation, CRC care increases the risk of poverty for nearly all patients who undergo treatment.

14. One Minute Preceptor Model: Incorporating an Interactive Didactic Session into Surgery Intern Orientation May Increase the Frequency of Medical Student Teaching

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Purpose: Residents are critically important educators to medical students; however, many have no formal instruction on teaching. The One-Minute Preceptor (OMP) model was incorporated into surgical intern orientation. We assessed the impact of this session on medical student evaluations of resident teaching.

Methods: A one-hour, resident-led OMP session was incorporated into the 2023 surgical intern orientation. Medical student evaluations of 2023 surgical interns who participated in this session were compared to evaluations of 2022 surgical interns who did not participate. Evaluations from the first three months of each cohort were included for analysis.

Evaluation Variable	Medical Student Evaluations for 2022 Interns (n = 37)	Medical Student Evaluations for 2023 Interns (n = 16)	p – value
Receptiveness to Questions, Likert Level (%)	5 (92%) 4 (8%)	5 (88%) 4 (12%)	0.632
Clarity of Presentations, Likert Level (%)	5 (84%) 4 (13%) 3 (3%)	5 (81%) 4 (6%) 3 (13%)	0.275
Knowledge of Basic Science, Likert Level (%)	5 (86%) 4 (11%) 3 (3%)	5 (81%) 4 (13%) 3 (6%)	0.831
Knowledge of Clinical Care, Likert Level (%)	5 (89%) 4 (8%) 3 (3%)	5 (81%) 4 (13%) 3 (6%)	0.504
Role Model Behavior, Likert Level (%)	5 (95%) 4 (5%) 3 (0%)	5 (88%) 4 (6%) 3 (6%)	0.456
Explain Operative Procedures and Anatomy, Likert Level (%)	5 (88%) 4 (6%) 3 (3%) 2 (3%)	5 (81%) 4 (0%) 3 (19%) 2 (0%)	0.166
Weekly Academic Discussions for the Purpose of Enhancing Knowledge, n (% Yes)	23 (62%)	15 (94%)	0.022

Results: Fifteen residents were included, eight from 2022 and seven from 2023, with 53 total evaluations. Higher frequency of weekly study sessions occurred in 2023 versus 2022 (94% vs 62%, $p = 0.022$); however, no other quantitative difference in resident teaching was identified ($p>0.05$). Coding yielded three major themes. In 2022, the prevailing theme was Establishing Psychological Safety: a resident "made a point to talk through … situations that provoked emotions in us to ensure that we were processing the rotation healthily". The prevailing theme for 2023 was Integrating Intentional Medical Student Teaching: the resident "always brought up thought-provoking topics for us to discuss and work through".

Conclusion: Integrating the OMP model into resident orientation demonstrated a positive impact on teaching frequency and increased medical student perceptions of residents as educators. Targeted didactic curricula for incoming interns may improve medical student teaching in busy clinical settings.

Theme: 2022	Code	Representative Quotation (s)
Establishing Psychological Safety	Clear Expectations and Goals	"He did a great job of directing us on how the logistics of the OR worked, as well as giving us an understanding of expectations for medical students on rotations."
	Integration of Students into Surgical Team	The resident "took great care in making sure everyone in our team was involved despite having 4 medical students. Everyone received opportunities to present patients, scrub in on surgeries, and help on dressing changes."
	Generating a Welcoming Enviroment	The resident "specifically made a point to talk through ethical dilemmas and other situations that provoked emotions in us to ensure that we were processing the rotation healthily, which had such a positive impact on my experience"
Theme: 2023	**Code**	**Representative Quotation (s)**
Integrating Intentional Medical Student Teaching	Efforts to Teach	"He was always so enthusiastic and ready to teach us. He always brought up thought-provoking topics for us to discuss and work through."
	Openness and Responsiveness to Questions	"He was very receptive to questions and took the time to help teach and elaborate on the topics we would ask about."
	Teaching Ability	The resident "created a learning environment that fostered the ability to learn within patient interactions, during surgeries, and rounds, all of which were conducive to my learning as a medical student."

15. Correlating Image-Based Obesity Metrics with Metabolic Pathway Changes in Non-Small Cell Lung Cancer (NSCLC)

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Background: The obesity paradox may be due to several factors like confounding by smoking, illness-induced weight loss, and use of Body mass index among others. Our previous study used the Visceral fat index as a measure of obesity and showed high fat is associated with poor overall survival and recurrence-free survival. The fundamental physiological reason for the increased risk of lung cancer in the obese population is still not clear. We intend to understand these mechanisms by looking at the gene expression changes and correlating them with image-based measures of obesity.

Methods: We used an image analysis software called SliceOmatic on the pre-operative images on 143 lung cancer patients, to measure the Total Fat Area (TFA). We measured the subcutaneous and visceral fat area at the L3 vertebra and combined it to get TFA. Gene expression data was generated by ORIEN as part of a project from 143 lung tumors of squamous and adenocarcinoma histologies. Using a metabolic analysis pipeline developed and validated by us, we used these gene expression differences to map out alterations in metabolic pathways central to this phenomenon.

Results: Of 53,425 transcripts considered expressed, 1,154 transcripts were differentially expressed ($p < 0.05$ and $logFC > 0.58$). Figure 1(A, B) shows a volcano plot highlighting differentially expressed genes as well as the 20 pathways most highly enriched with adiposity, 10 of which were upregulated, and 10 were downregulated. Utilizing our metabolic pipeline, we found 58 metabolic pathways to be significantly enriched ($p < 0.05$; Figure 1C) in the high TFA individuals, as compared to the low TFA individuals. The most important metabolic pathways enriched were cell-signaling pathways, components of cellular respiration, various streams of fatty acid metabolism, and activating pathways of immune signaling. These significant differences were not noted when the data was analyzed by dividing the patients according to their BMI.

Conclusions: Image-based measures of adiposity are related to significant gene expression changes in NSCLC tumors. We have identified several metabolic vulnerabilities induced by obesity in NSCLC that can be manipulated as new approaches to therapy.
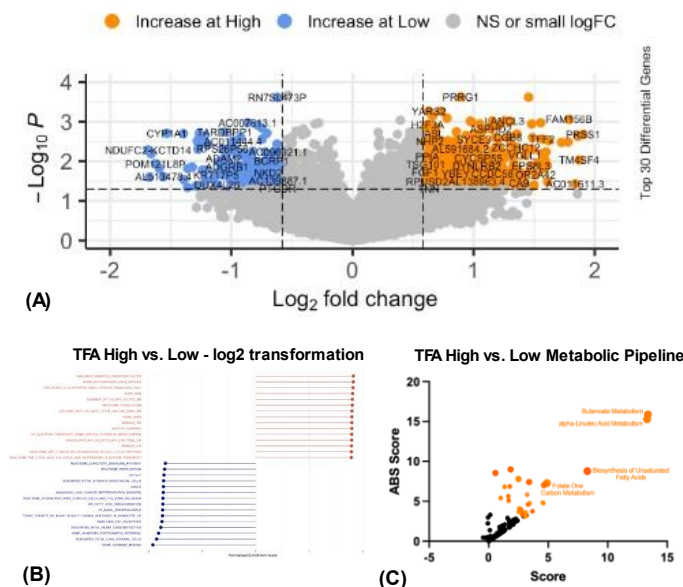

Figure 1. Total fat area association with difference in gene expression (A); Geneset enrichment pathways (B); Metabolic pipeline analysis reveals dysregulated metabolic pathways in high vs low TFA.

16. The Anatomy of Gossip: Dissecting Dynamics and Impacts in Surgical Residency

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Background: Gossip, defined by social scientists as "evaluative talk about an absent third party," is anecdotally pervasive, yet poorly understood in surgical residency programs. This study sought to deconstruct the role of gossip in surgical residency and evaluate its impact through the lens of surgical residents.

Methods: We recruited 36 residents from 9 surgical training programs through the Collaboration of Surgical Education Fellows, a multi-institutional group of surgical education researchers. Each resident participated in a semi-structured interview developed using relevant social science frameworks. Two researchers coded deidentified transcripts. The entire research team established themes together using a reflexive thematic analysis rooted in grounded theory.
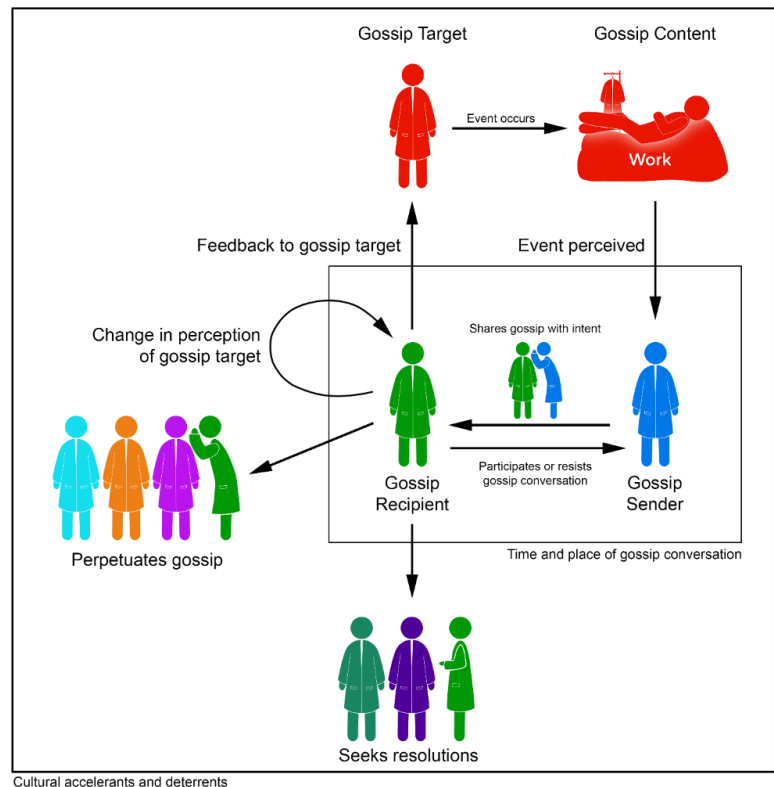
Results: Forty-eight codes were organized into six categories and eleven subcategories, which were used to construct a process model describing how gossip occurs in surgical residency (Figure). Seven overarching themes describing the impact of gossip were developed: 1) The definition of gossip is elusive yet can include both positive and negative connotations; 2) Gossip contributes durably to one's reputation within a program; 3) Gossip can be used as a form of instruction; 4) Gossip flourishes in environments without transparency and among those experiencing burnout; 5) Gossiping across a hierarchy may force those lower on the hierarchy into uncomfortable situations; 6) Remaining mindful of gossip's potential impact can improve culture; and 7) Gossip can build or destroy trust.

Conclusion: Gossip is a complex social phenomenon with the potential to harm or help surgical residents. Rather than trying to eliminate gossip, programs should encourage the known positive impacts of gossip by increasing transparency, enhancing resident wellness, building awareness of existing hierarchies, and improving resident emotional intelligence.

17. Gun violence and access to Stop the Bleed training in Western New York

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Background: Gun violence in Western New York remains a significant public health concern, as is similarly the case with many other cities in the US. Previous work demonstrated a strong correlation between levels of socioeconomic disadvantage and prevalence of gun violence for communities in the greater Buffalo area. Stop the Bleed (STB) training is a 1-hour hemorrhage control course aimed at empowering the public to recognize and control life-threatening bleeding. The aim of this project was to highlight the inequity that exists in Western New York with respect to access to Stop the Bleed training.

Methods: Locations and dates of Stop the Bleed course offerings in Western New York were collected from local 'super-instructors', providing a relatively comprehensive list of STB course offerings since the program's roll-out in 2016. The course locations were plotted on a map of Western New York and Area Deprivation Index (ADI) was calculated for each of the various sites. These sites were stratified by ADI decile and by zip code. The courses were also stratified based on intended audience. Shooting data was from two different sources: (1) gunviolencearchive.org a free, open-source registry of gun violence across the country (2) the Erie County Medical Center trauma registry.

Results: Two-hundred-seventy Stop the Bleed courses were identified. Gun violence data from both sources demonstrated that most shootings were taking place in the City of Buffalo (85- 97%). Despite this fact, fewer than half of Stop the Bleed courses taught in WNY have been in the City of Buffalo. Further, when courses offered to healthcare organizations and EMS agencies are removed from from the calculation only 25.5% of courses were available to residents of these communities. Five zip codes with the greatest number of shootings (14208, 14211, 14212, 14213 and 14215) accounted for 285/ 449 shootings (63% of all shootings), yet only 14% of courses were taught in these communities (38/270). This number drops to less than 3% when examining courses specifically offered to the lay public (no EMS or healthcare affiliation.) Twenty percent of courses (54/270) were taught at sites that fell

Red- Shooting

Blue- STB

within the highest decile for area deprivation index (indicating greatest level of disadvantage). Of courses taught in the City of Buffalo, only 45 courses (47%) were offered to members of the public.
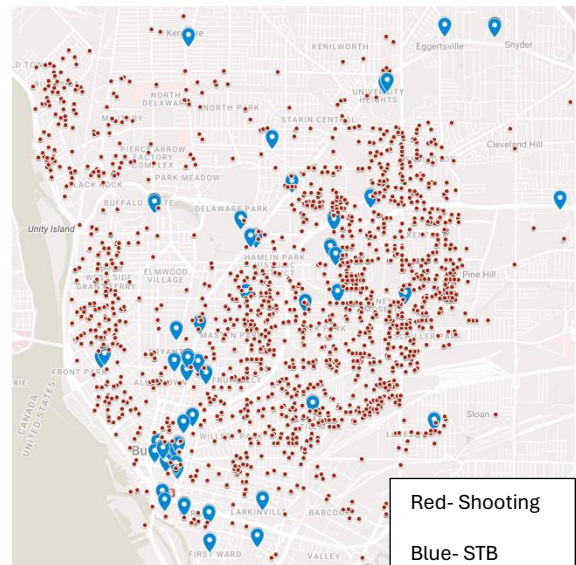
Conclusions: There is considerable imbalance in the distribution of Stop the Bleed training amongst communities in Western New York. This is, in large part, due to structural inequities that afflict the City of Buffalo and surrounding communities. This project has the potential to serve as a paradigm for how communities can evaluate and strive for equity. Stop the Bleed training offers the potential to empower individuals to act to control hemorrhage and save a life. Consequently, efforts must be made to foster deliberate inclusion of underserved communities in Buffalo. Partnering with community groups, businesses, schools, and faith-based organizations offers the opportunity to expand access to training.