

Surgical Oncology Research Department Summary of Accomplishments 2024

21 presentations at 10 national/international conferences, including:

- Southeastern Surgical Congress (SESC), 2024 Annual Meeting [Clearwater Beach, FL]
 - Cytoreductive Surgery and Hyperthermic Intraperitoneal Chemotherapy for Pancreatic Adenocarcinoma with Peritoneal Metastases: A Case Report Demonstrating Tumor Burden Reduction and Prolonged Survival
 - Quickshot Oral Presentation
- Advanced Cancer Therapies (ACT), International Conference on Surgical Cancer Care Annual Meeting [San Juan, PR]
 - Appendiceal Adenocarcinoma and the Role of Systemic Chemotherapy Prior to CRS/HIPEC: CONS
 - Invited Oral Plenary Debate Presentation
 - Beyond Standard Measures: A Comprehensive Evaluation of Quality of Life in Cytoreductive Surgery and Hyperthermic Intraperitoneal Chemotherapy Survivors
 - Oral Presentation
 - Small Bowel Obstruction and Ovarian Cancer: Insights from a Propensity-Score Matched Study in Patients with and without Hyperthermic Intraperitoneal Chemotherapy after Cytoreductive Surgery
 - Oral Poster Presentation
 - Systemic Inflammatory Markers: Predictors for Early Morbidity and Survival in Appendiceal Cancer Patients Treated with Cytoreductive Surgery and Hyperthermic Intraperitoneal Chemotherapy
 - Poster Presentation
 - Predicting 90-Day Readmissions Following Cytoreductive Surgery and Hyperthermic Intraperitoneal Chemotherapy: A Nested Case-Control Study
 - Poster Presentation
 - The Addition of Hyperthermic Intraperitoneal Chemotherapy to Cytoreductive Surgery is Safe in Appendix or Colon Cancer with Peritoneal Metastases and Concurrent Inflammatory Bowel Disease
 - Poster Presentation
- Society of Surgical Oncology (SSO), International Conference on Surgical Cancer Care Annual Meeting [Boston, MA]
 - Beyond Standard Measures: A Comprehensive Evaluation of Quality of Life in Cytoreductive Surgery and Hyperthermic Intraperitoneal Chemotherapy Survivors
 - Oral Poster Presentation
 - Published in *Annals of Surgical Oncology*
 - Systemic Inflammatory Markers: Predictors for Early Morbidity and Survival in Appendiceal Cancer Patients Treated with Cytoreductive Surgery and Hyperthermic Intraperitoneal Chemotherapy
 - Poster Presentation
 - Published in *Annals of Surgical Oncology*
 - Predicting 90-Day readmissions Following Cytoreductive Surgery and Hyperthermic Intraperitoneal Chemotherapy: A Nested Case-Control Study
 - Poster Presentation

- Published in *Annals of Surgical Oncology*
- Society of Gynecologic Oncology (SGO), Annual Meeting on Women's Cancer [Tampa, FL]
 - 90-Day Readmissions after Cytoreductive Surgery with Hyperthermic Intraperitoneal Chemotherapy in Advanced Ovarian Cancer
 - Poster Presentation
- American Society of Clinical Oncology (ASCO), 2024 ASCO Annual Meeting [Chicago, IL]
 - Filling the Gap in Competency-Based Training for Medical Oncology with Supervised Online Patient Counseling: A Qualitative Study
 - Poster Presentation
- Western Association of Gynecologic Oncology (WAGO), 2024 Annual Meeting [Seattle, WA]
 - Does Timing Matter? Association between Time to Chemotherapy and Survival in Ovarian Cancer Patients Treated with Cytoreductive Surgery and Hyperthermic Intraperitoneal Chemotherapy
 - Oral Presentation
 - Let's Talk About Sex: Sexual Wellbeing after Cytoreductive Surgery and Hyperthermic Intraperitoneal Chemotherapy (HIPEC) in Ovarian Cancer Survivors
 - Poster Presentation
- American College of Surgeons (ACS), ACS Quality & Safety Conference [Denver, CO]
 - The Impact of Definitive Treatment Out-Of-State after Diagnosis of Appendix Cancer
 - Poster Presentation
- International Society for the Study of Pleural and Peritoneum and the Peritoneal Surface Oncology Group International (ISSPP-PSOGI), 14th International Congress on Peritoneal Surface Malignancies
 - Utility of Left Lateral Lobectomy in removing Retrohepatic Lesions during Cytoreductive Surgery for Low-grade Mucinous Carcinomatosis
 - Oral Plenary Presentation
 - The Impact of Neighborhood-Level Disadvantage on Treatments and Outcomes in Newly Diagnosed Appendix Cancer
 - Poster Presentation
- American College of Surgeons (ACS), Annual Clinical Congress [San Francisco, CA]
 - Survival and Peritoneal Disease Control after Cytoreductive Surgery and Hyperthermic Intraperitoneal Chemotherapy in Colon Cancer Patients with Low and High Tumor Burden
 - Oral Quickshot Presentation
 - The Impact of Travelling Out-of-State for Definitive Treatment after Diagnosis of Appendix Cancer
 - Oral Poster Presentation
 - Roadmap to Hyperthermic Intraperitoneal Chemotherapy (HIPEC): Evaluating Referral Patterns and Eligibility in Patients with Appendiceal Neoplasms
 - Oral Poster Presentation
- National Organization for Rare Disease (NORD), Breakthrough Summit [Washington, DC]
 - Empowering Patient-Funded Research for Rare Cancers at a Community Hospital: A Success Story in Peritoneal Surface Malignancy
 - Lightning Round Oral Poster Presentation

8 publications in top-tier medical journals, topics include:

- *Annals of Surgical Oncology*
 - Quality of Life after Cytoreductive Surgery and Hyperthermic Intraperitoneal Chemotherapy (CRS/HIPEC): Cancer Survivors' Perspective Through In-Depth Interviews
 - Current cancer research is focused on not only improving survival, but maintaining quality of life. As such, several standardized questionnaires to help assess patient quality of life have been suggested. However, these were developed for specific cancers or more common treatments. Patients undergoing CRS/HIPEC face significant quality of life challenges due to advanced disease and complex treatment. Our research highlights the need for specialized QOL assessments tailored to this unique population, as standard questionnaires fail to capture their specific experiences. Through in-depth interviews with 8 CRS/HIPEC survivors, we identified key themes such as ongoing physical symptoms, mental health concerns, and the adjustment to life after treatment. We developed 22 new questions to better address these unmet needs. By developing patient-centered QOL instruments, we hope to enhance the understanding and care of CRS/HIPEC patients, ensuring their voices are heard and their challenges addressed.
 - ASO Author Reflections: Qualitative Research as an Avenue for Evaluating Quality of Life after Cytoreductive Surgery and Hyperthermic Intraperitoneal Chemotherapy
 - In this invited author reflections on the importance of the above full manuscript, we discuss the significant gap in understanding the quality of life challenges faced by patients undergoing CRS/HIPEC. While many CRS/HIPEC studies acknowledge the importance of quality of life, they often assess it using only standard questionnaires, which are likely insufficient for capturing the unique experiences of these patients. By engaging CRS/HIPEC patients in quality of life research, Mercy researchers developed a specialized questionnaire tailored specifically to this population. This will allow clinicians to improve patient-centered care, enhance patient outcomes, and address gaps in current assessment tools.
 - Correlation of Morphological Appearance of Peritoneal Lesions at Laparotomy and Disease at Pathological Assessment in Patients Undergoing Cytoreductive Surgery for Peritoneal Malignancy: Results of Phase 1 of the PRECINCT Study in 707 Patients
 - Mercy was one of 10 centers invited to participate in the PRECINCT study, an international multicenter prospective trial analyzing the accuracy of the surgical peritoneal cancer index to quantify pathologically confirmed disease in different peritoneal lesions. Findings showed that tumor nodule morphology had a significantly higher incidence of pathologically confirmed disease and highlighted the potential for more widespread use of frozen section. This work underscores the department's ongoing contributions to improving clinical decision-making and outcomes for peritoneal cancer patients.
 - ASO Author Reflections: It's Not Just What Surgeons See, But How They Interpret It
 - In this invited author reflections on the multicenter, international PRECINCT study, we discussed the evolution of the peritoneal cancer index and its importance in guiding cytoreductive surgery for peritoneal malignancies. By evaluating the correlation between peritoneal lesion morphology and

pathological findings, the study highlighted the importance of accurately classifying lesions during surgery, finding significant variability in PCI recording across centers. Going forward, they advocate for developing an image bank and utilizing technologies like fluorescence-guided surgery and artificial intelligence to refine surgical decision-making.

- *European Journal of Surgical Oncology*
 - Collaborative Expertise of Gynecological and Surgical Oncologists in Managing Advanced Epithelial Ovarian Cancer
 - **Over 70% of ovarian cancer patients are diagnosed with significant peritoneal spread, posing a significant and life-threatening clinical challenge. Not only is meticulous surgical technique required, but also an understanding of its unique biology and broader treatment options. In this study, Mercy Medical Center explores the benefits of synergizing efforts between gynecologic and surgical oncologists in treating advanced ovarian cancer. Utilizing this collaborative model between experts in cytoreductive surgery and ovarian cancer management resulted in optimized patient selection, a 94% complete cytoreduction rate (compared to 20-80% in the literature), careful long-term follow up with median overall survival >5 years, and the development of a thriving research program.

- *Surgical Oncology Insight*
 - Hyperthermic Intraperitoneal Chemotherapy (HIPEC) vs. Postoperative Intraperitoneal (IP) Chemotherapy – Impact on Health-Related Quality of Life in Primary Ovarian Cancer Patients after Cytoreductive Surgery
 - Mercy researchers have contributed to the growing body of evidence supporting the use of HIPEC as a treatment for ovarian cancer. Although some studies have shown survival benefits, concerns about quality of life have limited its broader adoption. In a Phase 2 randomized clinical trial, Mercy researchers compared the quality of life of newly diagnosed ovarian cancer patients treated with cytoreductive surgery and HIPEC followed by systemic chemotherapy to those receiving the standard of care (cytoreductive surgery followed by systemic chemotherapy). Quality of life was assessed both before surgery and over a two-year period following surgery. The results showed no statistically significant difference between the two groups. These findings suggest that concerns about quality of life should not be a barrier to further investigation and implementation of CRS/HIPEC for advanced ovarian cancer, and additional research into this treatment is warranted.
 - Surgical Management of Peritoneal Metastases from Appendix and Colon Cancer in Patients with Inflammatory Bowel Disease
 - Mercy researchers conducted a propensity-score matched study to investigate the impact of concurrent IBD on outcomes in patients undergoing CRS/HIPEC for appendix and colon cancer. Given that CRS/HIPEC often involves removing part of the colon and that one of the most common postoperative issues is bowel-related complications, patients with IBD may pose additional challenges, including impaired bowel function, a history of prior abdominal surgery, and the

use of immunosuppressive therapies. As a result, CRS/HIPEC surgeons may hesitate to operate on these patients due to concerns about postoperative complications and the potential effects on tumor biology and survival. This study found that patients with IBD are at higher risk for gastrointestinal complications (ie. nausea/vomiting, diarrhea) and are more likely to require postoperative readmission. However, despite these increased risks, long-term survival was not negatively impacted. These findings suggest that CRS/HIPEC should be considered for patients with IBD at experienced centers, with careful postoperative monitoring to ensure the best outcomes.

- Systemic Inflammatory Markers: Predictors of Survival in Mucinous Appendix Cancer Patients Treated with Cytoreductive Surgery and Hyperthermic Intraperitoneal Chemotherapy
 - Inflammation plays a critical role in tumor development and progression, and recent molecular studies have highlighted its significance in mucinous appendix cancer. However, the clinical implications in this context remain unclear. In this study, we evaluated the prognostic value of different systemic inflammatory markers, measured through preoperative blood tests, in mucinous appendix cancer patients treated with CRS/HIPEC. Our findings identified the monocyte-lymphocyte ratio (MLR) as the strongest and most reliable predictor of both progression-free and overall survival. By incorporating MLR alongside other known clinical factors, physicians can more accurately select candidates for CRS/HIPEC and refine surveillance and follow-up strategies, ultimately improving patient outcomes.

Active recruitment for 2 clinical trials:

- Appendiceal Microbiome Study, in collaboration with the American Gut Project
- A Phase II Randomized Study: Outcomes after Cytoreductive Surgery (CRS) with or without Carboplatin Hyperthermic Intraperitoneal Chemotherapy (HIPEC) Followed by Adjuvant Chemotherapy as Initial Treatment of Advanced Stage (stage III/IV) Ovarian, Fallopian Tube, and Primary Peritoneal Cancer (closed to enrollment, long-term observation only)

Extensive data collection and tracking with 9 observational studies

- Surgical Oncology Research Database and Tissue Resource
- Microbiologic and Immune Characteristics of Peritoneal Tissues in Patients with Appendiceal Cancer with Peritoneal Spread
- A Study of Tissue Molecular Markers and their Relationship to Treatment and Outcome in Appendiceal Cancer with Pseudomyxoma Peritonei (PMP)
- Use of Hyperthermic Intraoperative Chemotherapy at the Time of Interval Cytoreductive Surgery in Patients Managed with Neo-adjuvant Chemotherapy for Mullerian Cancers
- Clinical Outcomes and Feasibility of Hyperthermic Intraperitoneal Chemotherapy in Treatment of Uterine Leiomyosarcoma

- Next-generation Sequencing (NGS) and Analysis of Mutations in a Cohort of Patients with Peritoneal Carcinomatosis who Underwent Cytoreductive Surgery and/or Hyperthermic Intraperitoneal Chemotherapy (CRS/HIPEC)
- Identification of Genomic Alterations in Diffuse Malignant Peritoneal Mesothelioma
- Association between Frailty and Postoperative Complications Rate after Cytoreductive Surgery and Hyperthermic Intraperitoneal Chemotherapy (CRS/HIPEC)
- Quality of Life of Cancer Survivors after Cytoreductive Surgery and Hyperthermic Intraperitoneal Chemotherapy

Continued unique research collaboration with multiple institutions:

- Multi-Institutional International Peritoneal Surface Oncology Group (HIPEC)
- Gynecologic Oncology at Mercy Medical Center (Ovarian & Uterine Cancers)
- Pathology at Mercy Medical Center (PMP & Rare Tumors)
- Uniformed Services University (PMP)
- University of South Carolina (PMP)
- University of California, San Diego (PMP)
- Colorado State University (PMP)
- INOVA Fairfax Hospital (Colon Cancer, Ovarian Cancer, and Mesothelioma)
- University of Pittsburgh Medical Center (PMP, HIPEC)
- Basingstoke & North Hampshire Hospital, UK (PMP, HIPEC)

Establishing partnerships with outside organizations to analyze molecular profiles of exceptional and poor responders in appendiceal and ovarian cancers

- Caris Life Sciences
- BostonGene

Expansion of the research department team, including

- 4 Research Fellows, foreign medical graduates pursuing US-residency training
 - 3 from Russia (Drs. Sergei Iugai, Vladislav Kovalik, & Kseniia Uzhegova)
 - 1 from Colombia (Dr. Luis Falla Zuniga)
- 3 Research Interns, college students interested in pursuing a career in medicine
 - 1 Johns Hopkins University student (Gabe)
 - 2 University of Maryland students (Ananya & Ted)