

## **Surgical Oncology Research Department Summary of Accomplishments 2023**

31 presentations at 6 national/international conferences, including:

- Advanced Cancer Therapies (ACT), International Conference on Surgical Cancer Care Annual Meeting [San Diego, CA]
  - Sufficient Regional Lymph Node Examination for Staging High-Grade Appendix Cancer
    - Oral Presentation
  - Development and External Validation of Prognostic Survival Nomograms for Appendiceal Mucinous Carcinoma Peritonei after Cytoreductive Surgery-Hyperthermic Intraperitoneal Chemotherapy
    - Oral Presentation
    - Collaborative project with University of Pittsburgh Medical Center
  - Recurrence Patterns of Appendiceal Cancer after Complete Cytoreduction and Hyperthermic Intraperitoneal Chemotherapy
    - Mini-Oral Presentation
  - Impact of Preoperative Nutritional Status on Outcomes after Cytoreduction and Hyperthermic Intraperitoneal Chemotherapy
    - Mini-Oral Presentation
  - Peritoneal Metastasis of Advanced Epithelial Ovarian Carcinoma Treated with Cytoreductive Surgery and Hyperthermic Intraperitoneal Chemotherapy: A Retrospective International Multicentric Data Analysis
    - Mini-Oral Presentation
    - Collaborative project between 11 international HIPEC specialty centers
- Society of Surgical Oncology (SSO), International Conference on Surgical Cancer Care Annual Meeting [Boston, MA]
  - Maximal Tumor Debulking in the Management of Extensive Pseudomyxoma Peritonei
    - Invited Oral Plenary Presentation
  - Sufficient Regional Lymph Node Examination for Staging High-Grade Appendix Cancer
    - Oral Presentation
    - \*\*Recipient of the Dr. Thomas K. Weber Colorectal Cancer Research Scholar Award
    - Published in *Annals of Surgical Oncology*
  - Recurrence Patterns of Appendiceal Cancer after Complete Cytoreduction and Hyperthermic Intraperitoneal Chemotherapy
    - Published in *Annals of Surgical Oncology*
  - Impact of Preoperative Nutritional Status on Outcomes after Cytoreduction and Hyperthermic Intraperitoneal Chemotherapy
    - Published in *Annals of Surgical Oncology*
  - Using the Modified 5-item Frailty Index to Predict Complications after Cytoreductive Surgery and Hyperthermic Intraperitoneal Chemotherapy
    - Published in *Annals of Surgical Oncology*

- Development and External Validation of Prognostic Survival Nomograms for Appendiceal Mucinous Carcinoma Peritonei after Cytoreductive Surgery-Hyperthermic Intraperitoneal Chemotherapy
  - Collaborative project with University of Pittsburgh Medical Center
  - Published in *Annals of Surgical Oncology*
- Society of Gynecologic Oncology (SGO), Annual Meeting on Women's Cancer [Tampa, FL]
  - Health-Related Quality of Life after Cytoreductive Surgery and Hyperthermic Intraperitoneal Chemotherapy (CRS/HIPEC) is not Different than Cytoreductive Surgery Alone in Primary Ovarian Cancer Patients
    - Oral Plenary Presentation
- Society of American Gastrointestinal and Endoscopic Surgeons (SAGES), Annual Meeting [Montreal, Canada]
  - Technical Approach for Diagnostic Laparoscopy in Patients with Suspected Peritoneal Carcinomatosis
    - State of the Art Performance of Procedure Video Loop Presentation
- Peritoneal Surface Oncology Group International (PSOGI), 13<sup>th</sup> International Congress on Peritoneal Surface Malignancies [Venice, Italy]
  - Technique Advancement on CRS/HIPEC
    - Invited to present/moderate discussion as a Session Expert/Chair
  - Radiomics-CT Sarcopenia Model to Predict Major Postoperative Complications in Ovarian Cancer Patients Undergoing CRS/HIPEC
    - Oral Plenary Presentation
  - Variations in Recording the Surgical, Radiological, and Pathological PCI at Experienced Peritoneal Malignancy Centers Across the World – A Report from the PRECINCT Study
    - Oral Presentation
    - Collaborative project between 12 international centers as part of the PSOGI research group
  - Radiological Prediction of the Pathological Peritoneal Cancer Index – Is It Tumor Agnostic? Results from Phase 1 of the PRECINCT Study
    - Oral Presentation
    - Collaborative project between 12 international centers as part of the PSOGI research group
  - The Management of Extensive Pseudomyxoma Peritonei: Technical Considerations
  - Prognostic Significance of CA-125 ELIMINATION Rate Constant K and Its Correlation with Chemotherapy Response Score in Ovarian Cancer Patients Treated with Hyperthermic Intraperitoneal Chemotherapy
  - Left Lateral Liver Lobectomy Facilitates Safe Cytoreduction in the Left Retrohepatic Space in a Patient with Low-Grade Mucinous Carcinomatosis
  - Developing a Reportable CRS/HIPEC Operative Note in an Electronic Health Record System
  - Quality of Life after Cytoreductive Surgery and Hyperthermic Intraperitoneal Chemotherapy (CRS/HIPEC): Cancer Survivors' Perspective
  - Patterns of Regional Lymph Node Involvement Secondary to Peritoneal Metastases in Patients Undergoing Cytoreductive Surgery – Results from Phase 1 of the PRECINCT Study

- Collaborative project between 12 international centers as part of the PSOGI research group
- Impact of Previous Abdominal Surgery and Timing of Peritoneal Metastases on Accuracy of Imaging in Predicting the Surgical PCI – A Report from the PRECINCT Study
  - Awarded “Best Poster”
  - Collaborative project between 12 international centers as part of the PSOGI research group
- Pattern of Peritoneal Dissemination in Patients Undergoing Cytoreductive Surgery for Gastric Peritoneal Metastases – A Report from Phase 1 of the Prospective, Observational, Multi-Center PRECINCT Study
  - Collaborative project between 12 international centers as part of the PSOGI research group
- Supra-mesocolic Lymph Node Metastases Secondary to Peritoneal Metastases in Patients with Epithelial Ovarian Cancer Undergoing Cytoreductive Surgery – Results from Phase 1 of the PRECINCT Study
  - Collaborative project between 12 international centers as part of the PSOGI research group
- Correlation between the Distribution of Colorectal Peritoneal Metastases in the Peritoneal Cavity and the Mechanism of Peritoneal Spread – An Analysis from the PRECINCT Study
  - Collaborative project between 12 international centers as part of the PSOGI research group
- Morphological Appearance on Imaging and the Incidence of Disease on Pathology in Patients with Colorectal Peritoneal Metastases Undergoing Cytoreductive Surgery – Results from the PRECINCT Study
  - Collaborative project between 12 international centers as part of the PSOGI research group
- The Surgical PCI is an Objective Score Based on a Subjective Evaluation of Disease in the Peritoneal Cavity – A Report from the PRECINCT Study
  - Collaborative project between 12 international centers as part of the PSOGI research group
- Correlation between Intraoperative Morphology of Peritoneal Metastases and the Presence of Disease on Pathology in Patients Undergoing Cytoreductive Surgery – A Report from the PRECINCT Study
  - Collaborative project between 12 international centers as part of the PSOGI research group
- National Organization for Rare Diseases, 2023 Annual Breakthrough Summit [Washington, DC]
  - Clinical Characteristics and Outcomes of Patients with Goblet Cell Carcinoma of the Appendix Treated with Cytoreductive Surgery and Hyperthermic Intraperitoneal Chemotherapy

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

- *Annals of Surgical Oncology*
  - Patterns of Recurrence in Appendix Cancer After Complete Cytoreduction and Hyperthermic Intraperitoneal Chemotherapy
    - \*\*Mercy is one of the few centers with long-term follow-up of appendix cancer patients after complete CRS/HIPEC, which allowed us to evaluate the natural history and recurrence patterns of each subtype after optimal treatment with complete CRS/HIPEC. In this extensive analysis, Mercy demonstrated that, contrary to common assumptions, all subtypes (both low-grade and high-grade tumors) recur most commonly within the abdominal cavity. Moreover, more than half of patients who recurred in the abdomen were amenable to a second surgery. This data will help physicians provide tailored surveillance plans and improve post-relapse management.
  - ASO Author Reflections: Let's Redouble Efforts to Stop Peritoneal Recurrence in All Types of Appendix Cancer
    - \*\*Because of the impact of the above publication, the *Annals of Surgical Oncology* invited us to write a commentary on the clinical significance of our results that challenge current assumptions. Conventional understanding suggests that low-grade tumors recur within the abdominal cavity, while high-grade tumors spread outside the peritoneum. Our groundbreaking work demonstrated that all histologic subtypes, including high-grade tumors and signet ring cells, recur most frequently within the abdominal cavity. This work provides important information on the natural history of each subtype, offering valuable insights for surveillance and postrecurrence management.
- *European Journal of Surgical Oncology*
  - Outcomes after Cytoreductive Surgery with Hyperthermic Intraperitoneal Chemotherapy for Peritoneal Dissemination from Ovarian Carcinosarcoma
    - \*\* Currently, patients with peritoneal metastases of ovarian carcinosarcoma are offered a variety of treatments, with no clear consensus on how to manage this heterogeneous disease. The many treatment avenues make comparing treatments and patient cohorts difficult. In this one-of-a-kind study, Mercy found that CRS/HIPEC can achieve comparable survival results to alternative chemotherapy treatments and showed very low rates of bowel obstruction, which suggests an improved quality of life for patients facing this devastating disease.
  - Peritoneal Metastasis of Advanced Epithelial Ovarian Carcinoma Treated with CRS/HIPEC: A Retrospective International Multicentric Data Analysis
    - \*\* As an internationally recognized CRS/HIPEC center, Mercy was invited to participate in an 11 center, international collaboration to investigate the outcomes in ovarian cancer. Recently, there is great interest in using CRS/HIPEC to treat advanced ovarian cancer, but there are many questions surrounding patient selection, treatment sequence, and true survival benefit. Mercy contributed the largest number of patients to this study, which showed that

CRS/HIPEC was associated with improved overall and progression-free survival and should play a role in the treatment of ovarian cancer.

- *Cureus*
  - Achieving Intraperitoneal Disease Control Using Cytoreductive Surgery and Hyperthermic Intraperitoneal Chemotherapy: Two Cases of Metastatic Breast Cancer
    - \*\*Once breast cancer spreads to the abdominal cavity, patient survival and quality of life are significantly impacted and there are few treatment options. In this unique case report, we present two patients with peritoneal metastases from breast cancer who were treated successfully at Mercy with CRS/HIPEC. Both patients had complete resolution of abdominal symptoms and meaningful survival of over 3 years. This important report may allow other similar patients to be considered for CRS/HIPEC treatment.

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)

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

- Tempus Labs, Inc.
- Caris Life Sciences
- BostonGene

Expansion of the research department team, including

- 6 Research Fellows, foreign medical graduates pursuing US-residency training
  - 4 from Russia
  - 2 from Colombia
- 5 Research Interns, college students interested in pursuing a career in medicine
  - 1 post-grad
  - 2 Johns Hopkins University students
  - 1 College of Holy Cross student
  - 1 high school senior