

## Comparing Robotically-Assisted Procedures and Open Laparotomy in Heated Intraperitoneal Chemotherapy for Peritoneal Carcinomatosis

**Background:** Peritoneal carcinomatosis (PC) is characterized by the spread of cancer cells in the abdominal cavity, particularly the serous membrane of the peritoneum. Appropriately selected patients can be treated with combined cytoreductive surgery (CRS) and hyperthermic intraperitoneal chemotherapy (HIPEC) to resect the disease and enhance tissue penetration and efficacy of chemotherapeutic agents. CRS can be performed via open laparotomy or using minimally invasive, robotically-assisted techniques. Surgical protocols for robotically-assisted procedures in CRS/HIPEC, however, are still under development until more comparative research is done on safety and effectiveness.

**Methods:** A retrospective cohort was assembled of adults who received CRS/HIPEC for PC at a rural tertiary healthcare facility since 2008, stratified by those who underwent robotically-assisted procedures versus open laparotomy. Associations between surgical technique and perioperative and 30- and 90-day postoperative complications, as well as length of hospital stay (LOS) were modeled using multivariable linear and logistic regression.

**Results:** There were 76 patients in the analytical dataset, with 29% in the robotically-assisted group (since those surgeries began in 2018). The two groups were generally similar at baseline, but the robotically-assisted group had a significantly lower Peritoneal Carcinomatosis Index (PCI) score (4.0 vs. 11.2,  $p < 0.001$ ), indicating less PC spread and associated disease burden. After covariate adjustment for PCI, year of surgery, and other potential confounding factors, patients who underwent robotically-assisted CRS/HIPEC experienced about 0.5 day shorter LOS relative to laparotomy ( $p = 0.003$ ). No significant differences were observed in perioperative, or 30- or 90-day postoperative, complications between groups.

**Conclusions:** Data on robotically-assisted CRS/HIPEC surgeries remains limited, but increasingly available as the technique becomes more common. Findings from this early analysis suggest robotically-assisted procedures have mainly been reserved for patients with lower underlying PC disease burden, but can result in fewer days in the hospital and negligible differences in surgery complications compared to laparotomy.