

Viviana Flores RN, CNOR, RNFA, RNAS-C; Cera Salamone MSN, RN, NE-BC, CNOR, HACP; Michelle Johann RN, DNP, CPAN, PHN; Jeannine Vilella MD; Tri Dinh MD; Jill Whyte MD; Richard L. Whelan MD; Ernest Han MD; Mihae Song MD; Joshua Cohen MD; Mustafa Raof MD; and Thanh Dellinger MD

Introduction

- The administration of chemotherapy via Pressurized Intraperitoneal Aerosol Chemotherapy (PIPAC) intraoperatively presents unique clinical challenges requiring meticulous coordination, rigorous safety protocols, and innovative process development.
- This clinical improvement project highlights the pivotal role of the perioperative team. The registered nurses (RNs) within a multidisciplinary team—including surgeons, surgical technologists (STs), anesthesiologists, and pharmacists—are involved in designing and implementing a safe, standardized workflow to deliver PIPAC chemotherapy effectively.
- Our team, comprised of 4 perioperative RNs, 4 STs, 4 surgeons, 1 anesthesiologist, and 1 pharmacist collaborated to develop a comprehensive intraoperative process integrating patient safety measures, staff safeguards, and operational efficiency. Key elements included preoperative planning with enhanced communication strategies, real-time intraoperative coordination, and postoperative debriefing to ensure continuity of care and procedural safety.

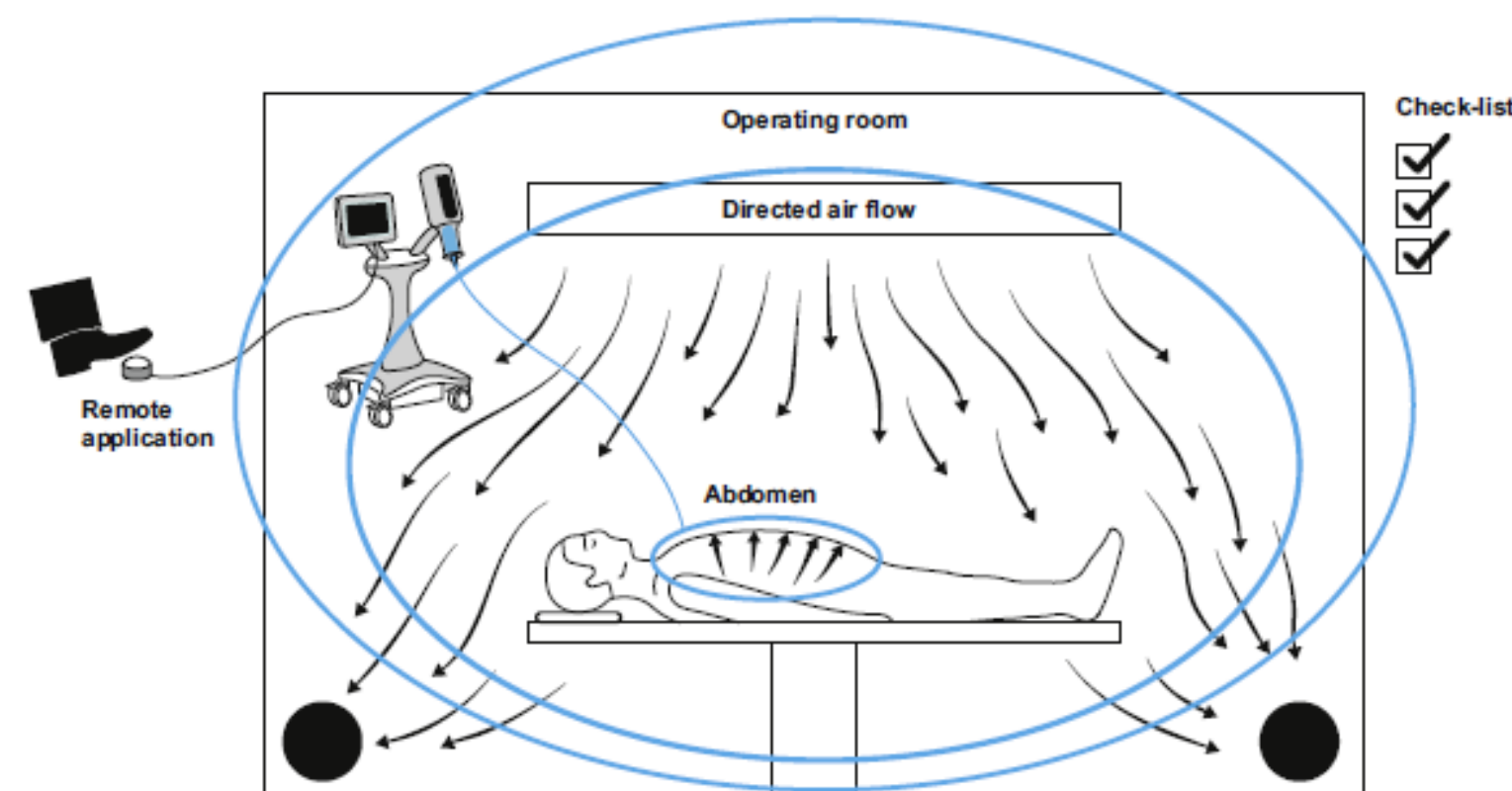


Figure 1. PIPAC safety considerations. Containment to prevent chemotherapy leakage in the operating theater.¹

Assessment

This initiative demonstrates how perioperative RNs serve as essential facilitators in bridging clinical innovation with safety and quality care standards. By fostering multidisciplinary collaboration, comprehensive education, and stringent process controls, the team successfully integrated PIPAC chemotherapy delivery into intraoperative practice, enhancing patient outcomes while mitigating risks.

Implementation

The implementation of the new workflow went smoothly. The team prioritized training, which focused on the overall procedural changes, including educational sessions and practice run-throughs. The process was dynamic, and adapting quickly was essential to ensure that safety measures and workflows were effectively established for each team member.

Preparation and planning

- To prepare, special considerations addressed by the team involved training all staff on the novel procedure, specialized equipment use, and strict adherence to safety standards, particularly regarding chemotherapy exposure risks with three layers of safety, including airtight, abdomen, advanced ventilation, and removing all personnel from the OR. The team had to plan to meet requirements for remote monitoring of the patient during the surgery and aerosolized chemotherapy.
- The team also navigated the utilization of equipment for off-label research purposes, necessitating a rigorous protocol development and staff education to maintain compliance and patient safety with strict adherence to the protocol.
- The team worked to establish a robust supply chain and inventory management system to source and manage international disposables critical to the procedure. Implementing PIPAC protocols is a special circumstance and requires extensive preparation and dedication from the team.

Contacts

Viviana Flores RN, CNOR, RNFA RNAS-C
City of Hope
Email: vflores@coh.org
Phone: 626-218-8100

Thanh Dellinger, MD
City of Hope
Email: tdellinger@coh.org
Phone: 626-218-3505

References

- ¹Hubner, Teixeira, et al., *Gastroenterology Research and Practice*. 2017; DOI: 10.1155/2017/6852749.
²Solass, Giger-Pabst, et al., *Surgical endoscopy*. 2012; DOI: 10.1007/s00464-012-2148-0.

Outcome

- The team successfully integrated PIPAC delivery into intraoperative practice, enhancing patient outcomes while mitigating risks.
- Over a 6-month period, multiple training programs took place to separately educate OR RNs and scrub techs, pharmacists, anesthesiologists, and postoperative RNs in perioperative chemotherapy administration via PIPAC.
- Dr. Marc Reymond, inventor of PIPAC² visited the site to give a lecture to surgeons and anesthesiologists and he remotely proctored the procedure during the first PIPAC to ensure protocol adherence.
- Over 100 PIPAC procedures between August 2020 and December 2025 were performed with no occupational safety issues, no chemotherapy leaks, and no patient safety issues.
- The PIPAC program successfully expanded to two other sites at Northwell, NY, and Mayo Clinic.
- Three PIPAC training and certification courses have been hosted by the U.S. Collaborative PIPAC program, including two at COH in 2022 and 2024, and one at Northwell, NY, in 2025.
- A training video detailing the safety precautions and instructions was made by the COH PIPAC program and is available at <https://youtu.be/EIMuxQwxgfo>.
- Patient experiences of PIPAC and positive impact on Quality of Life were featured in *Cure Magazine* <https://www.curetoday.com/view/innovative-approach-to-chemotherapy>.

Implications for perioperative nursing

- Our findings support the expanding role of perioperative nursing in clinical research environments and underscore the importance of innovation-driven teamwork in improving complex surgical procedures.
- This presentation outlines the development process, safety protocols, staff training strategies, and operational challenges addressed, providing a replicable model for institutions seeking to implement intraoperative chemotherapy or similar novel therapies.
- This initiative demonstrate how perioperative RNs serve as essential facilitator in bridging clinical innovation with Safety and Quality care Standards by fostering multidisciplinary collaboration, comprehensive education and stringent process controls.

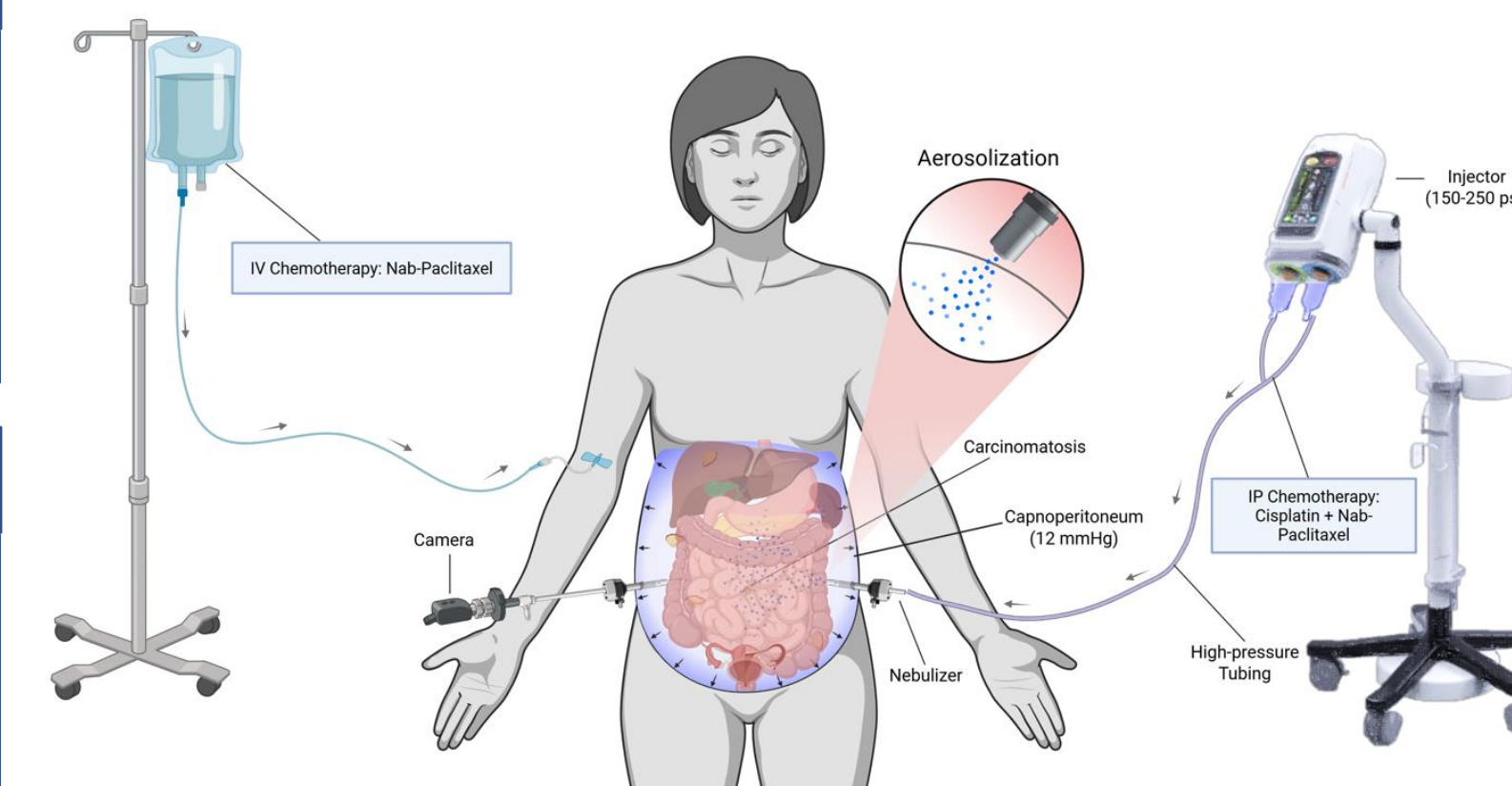


Figure 2. PIPAC is a laparoscopic chemotherapy delivery method for superior drug delivery to peritoneal metastases. PIPAC improves drug distribution through aerosolization of chemotherapy in the abdominal cavity, via a micropump. It improves drug tissue absorption through pressurization of the drug via a 12 mmHg capnoperitoneum induced by a high-pressure injector.

Table 1. Clinical trial arms and experimental design schema.

	Cancer	Treatment
Arm 1	Ovarian, uterine, gastric	PIPAC cisplatin + doxorubicin q6w
Arm 2	Colorectal, appendiceal	PIPAC oxaliplatin + IV 5-fluorouracil/leucovorin q6w
Arm 3	Colorectal, appendiceal	PIPAC Mitomycin C q6w + IV FOLFIRI weeks 2 and 4 q6w
Arm 4	Ovarian	PIPAC cisplatin + nab-paclitaxel q35d plus IV nab-paclitaxel D8, D15 q35d

