

Safe Workflow Process for the Pressurized Intraperitoneal Aerosolized Chemotherapy

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ASSESSMENTS

The pressurized intraperitoneal aerosolized chemotherapy (PIPAC) surgical procedure has been performed in Europe for a few years. This procedure provides a surgical chemotherapy option for terminal patients with abdominal cancer. These cases are being performed at limited number of hospitals across the USA. According to Fang et al, "during PIPAC, liquid chemotherapeutic drugs are aerosolized with a typical median particle size of less than 30µm at a flow rate of 0.5-0.7 ml/s (2025). There is limited amount of literature review material to develop a checklist and aerosolized chemotherapy workflow processes to reduce exposure.

DESCRIPTION OF THE TEAM

An interdisciplinary team was formed which included the General oncology surgical provider, perioperative leadership, clinical nurse specialists (oncology and perioperative), clinical nurse educators, pharmacy, Safety department, and supply chain.

REFERENCES:

Dellinger, T. H. (2019). *Occupational health and safety aspects of PIPAC*. ISSPP PIPAC Essentials Educational Series. (Professional guidance document on safe OR implementation.)
Fan, Q., Li, R., Yang, Z., & Li, Y. (2025). *Research progress in techniques related to pressurized intraperitoneal aerosol chemotherapy (PIPAC)*. *Holistic Integrative Oncology*, 4, Article 63.

PLANNING & PREPARATION

- The aerosolized chemotherapy would be delivered using a wand connected to a pressure injector through a laparoscopic port. This type of aerosol delivery provided a risk of exposure to the operating room team. The interdisciplinary team identified lack of workflow safety process, supplies, and knowledge deficit of the pressure injector.
- A gap analysis was performed to analyze the current chemotherapy workflows.
- The team developed a preparation and delivery method of the cytotoxic drug agent to reduce the possibility of staff exposure.
- The delivery of the cytotoxic drug agent aerosol required the surgical team to step out of the OR. Video integrated system representatives were consulted to remove any visual barriers so the surgical team to view peritoneal cavity, anesthesia monitoring, etc. using a monitor and operating room installed cameras to visualize the anesthesia monitor, laparoscopic peritoneum view of the wand
- Removal of the aerosol particles after the delivery of chemotherapy. The interdisciplinary team reviewed literature to ensure there is a safe particle removal specifications of CAWS (Dellinger, 2019).

IMPLEMENTATION

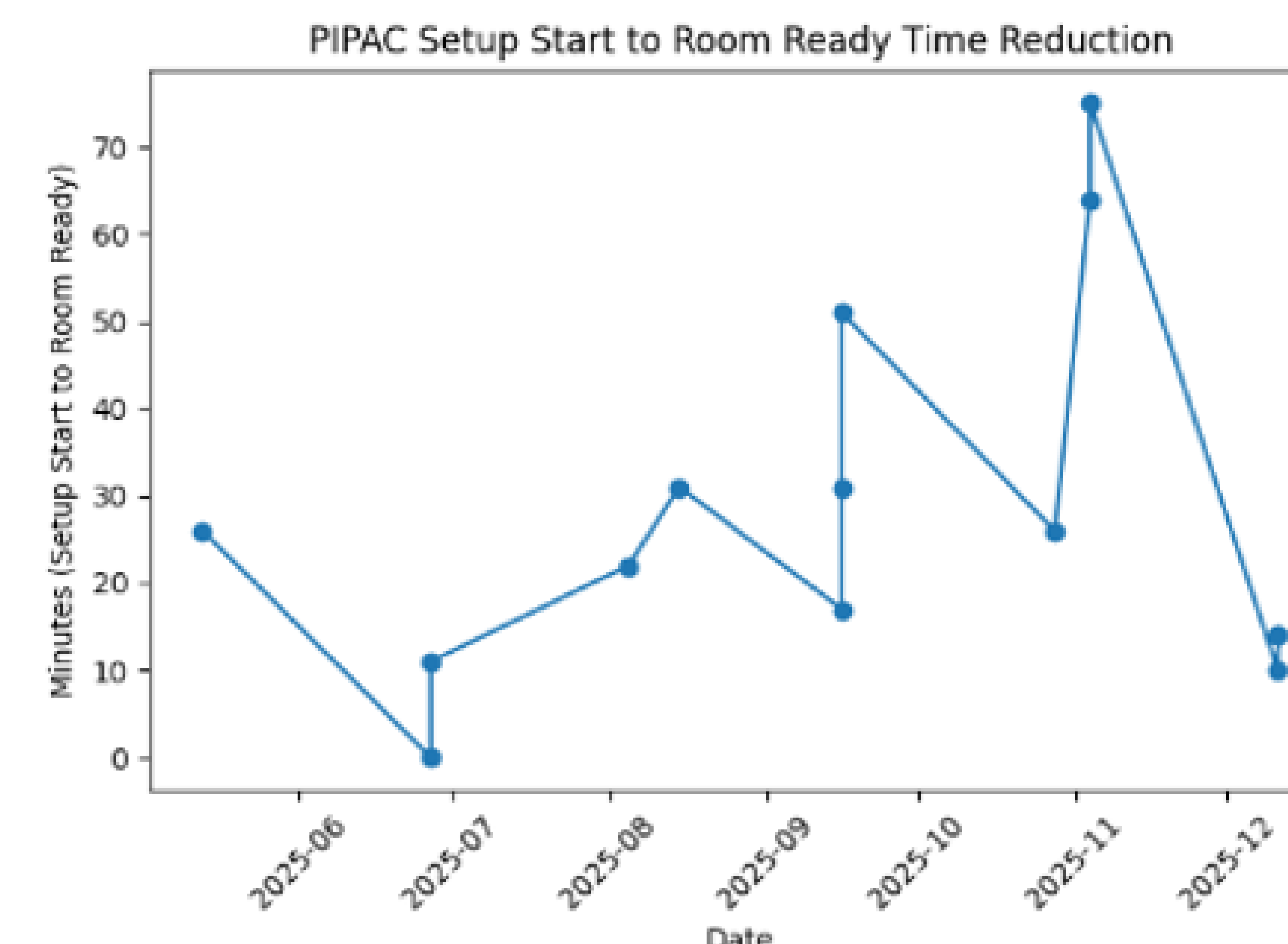
May 13, 2025: 1st procedure performed at UChicago Medicine.

May 2025 – December 2025: 15 Cases performed

Of the 15 cases, four patients had repeated rounds of PIPAC therapy in the operating room.



PIPAC Setup Start To Room Ready Time Reduction



Delays in September - November were related to pharmacy chemotherapy drug order release/delivery and PIPAC pressure injector equipment issues.

OUTCOMES

In May 2025, the first PIPAC surgical was performed at UChicago Medicine. To date, the UChicago has completed additional PIPAC procedures with future procedures scheduled.

The use of the PIPAC checklist and an equipment tip sheet provided aerosol hazardous agent workflow safety resources for the intraoperative perioperative nurse and surgical team.

Lesson Learned:

- The timely preparation and delivery of cytotoxic drug agent to the Operating Room.
- Pressure injector tubing air removal and comfort level of the staff to operate the equipment.
- CAWS supply and equipment was reviewed and changed to a disposable supply versus the use of a CAWS equipment unit.
- Installation of a monitor outside of the operating room for Multiview of the room camera, patient vitals, and anaesthesia machine camera view aided in the isolation time during injection outside of the room for the clinical team.

IMPLICATIONS FOR PERIOPERATIVE NURSING

The PIPAC surgical procedures can be performed using a comprehensive checklist and aerosol hazardous agent workflow safety process. These can limit the risk to the intra-procedure perioperative nurse

ACKNOWLEDGEMENTS:

Dr. Mecker Moller for having the vision and passion to bring the PIPAC workflow to the University of Chicago Medicine. The operating room education team for their dedication in training our staff on the pump and safety protocols, the multimedia teams who assisted in getting the monitor installed outside of the operating room and operating room leadership for supporting this initiative.