

## EP7EO – INTERPROFESSIONAL CARE

### WAITING TO EXHALE: REDUCING THE AVERAGE LENGTH OF STAY AMONG POST-CARDIAC SURGERY PATIENTS

*Using the required empirical outcomes presentation format, provide one example of an improvement in a specific patient population outcome associated with nurse's(s) participation in an interprofessional collaborative plan of care.*

#### **Problem**

Clinical nurses in the CTICU (5MB/HH-605150) [CTICU] at NewYork-Presbyterian/Columbia University Irving Medical Center (NYP/Columbia) noted that patients undergoing cardiac surgery, such as coronary artery bypass grafting (CABG) and valve repair/replacement surgeries, had an increase in their average length of stay (ALOS). Early extubation has been shown to reduce the ALOS in post-cardiac surgery patients. The Society of Thoracic Surgeons (STS) defines early extubation as extubation within six hours upon ICU arrival after cardiac surgery. The CTICU clinical nurses noted that more than half of patients post-cardiac surgery had an extubation time over six hours, thereby contributing to an increase in ALOS in this specific patient population.

#### **Pre-Intervention**

January 2022:

- The ALOS of CTICU post-cardiac surgery patients was 53.5 days in January 2022.
- With the approval of Ellen Ramos-Mupo, MSN, RN, NEA-BC, CCRN-K, Patient Care Director (nurse manager, at the time), CTICU, clinical nurses Bridgette Bennett, DNP, RN, CCRN; Helen Su, BSN, RN, CCRN-CSC; Matthew Naylor, MS, BSN, RN, CCRN; Alex Merrill, PA-C, physician assistant, CTICU; Keisha Bailey, MSN, RN, AGACNP-BC, nurse practitioner, CTICU; and Jessi Green, MSN, RN, AGCNS-BC, CVRN, Manager, Ventricular Assist Device (VAD) Program re-examined the Enhanced Recovery After Surgery (ERAS) cardiac

protocol – an interprofessional plan of care for early extubation. Although this protocol was rolled out in May 2020, full adoption was slow and varied among the team due to the high turnover in CTICU during the COVID-19.

- Ms. Ramos-Mupo, Dr. Bennett, Ms. Su, Mr. Naylor, Ms. Merrill, Ms. Bailey, and Ms. Green met with Jonathan Hastie, MD, Medical Director, CTICU; Lauren Sutherland, MD, Associate Medical Director, CTICU; Evangeline Veloria, MSN, RN, ACNP-BC, nurse practitioner, CTICU; and Danielle Langone, PA-C, physician assistant, CTICU; They formed a CTICU Task Force and identified barriers to early extubation and evidence-based solutions to improve patient outcomes which included:
  - Barrier: Hypothermia. Solution: Rewarming process to begin in OR (MB3,4-605320) [OR], liberalizing the 36-degree cutoff for spontaneous awakening trials (SAT)
  - Barrier: Heavy Sedation. Solution: Discontinue sedation within one hour of arrival to the intensive care unit (ICU) or coming up from the OR with dexmedetomidine drip only, not propofol
  - Barrier: Pain control. Solution: Effective pain control; adjunctive therapies such as intra-operative IV Tylenol® and Zofran®
  - Barrier: Hypoxemia. Solution: Early positive end-expiratory pressure (PEEP)/respiratory maneuvers for those who are presenting with hypoxemia; Extubate to bilevel positive airway pressure (BiPap)/high flow nasal cannula (HFNC) when necessary, rather than remaining intubated
  - Barrier: Lack of respiratory therapists (RT). The current ERAS protocol required RTs to be present during extubation. Solution: Registered nurse (RN)/provider to extubate to eliminate wait time for respiratory therapists
  - Barrier: Discomfort overnight. Solution: Identifying very specific patients who should remain intubated through the night as difficult intubation is not a reason to delay extubation

**Goal**

To reduce the ALOS in days for CTICU post-cardiac surgery patients

**Participants**

Name/Credentials	Discipline	Title/Role	Department/Unit
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Bridgette Bennett, DNP, RN, CCRN	Nursing	Clinical Nurse	CTICU
Helen Su, BSN, RN, CCRN-CSC	Nursing	Clinical Nurse	CTICU
Matthew Naylor, MS, BSN, RN, CCRN-CSC	Nursing	Clinical Nurse	CTICU
Ellen Ramos-Mupo, MSN, RN, NEA-BC, CCRN-K	Nursing	Patient Care Director (nurse manager, at the time)	CTICU
Jessi Green, MSN, RN, AGCNS-BC, CVRN	Nursing	Manager, VAD Program	Cardiac Service
Evangeline Veloria, MSN, RN, ACNP-BC	Nursing	Nurse Practitioner	CTICU
Keisha Bailey, MSN, RN, AGACNP-BC	Nursing	Nurse Practitioner	CTICU
Lauren Sutherland, MD	Medicine	Associate Medical Director	CTICU
Jonathan Hastie, MD	Medicine	Medical Director	CTICU
Alex Merrill, PA-C	Medicine	Physician Assistant	CTICU
Danielle Langone, PA-C	Medicine	Physician Assistant	CTICU

**Intervention**

February 2022:

- The CTICU Task Force developed a visual cue card to be placed on the patient’s door designating eligibility for early extubation. These cue cards were completed upon admission to the CTICU based on the hand-off from the OR. The cue cards categorized patients into the following:
  - Fast Track- Sedation is turned off one hour after arrival to CTICU
  - Go Slow- Patient is not ideal for early extubation

*Impact Statement: The cue card helped initiate a conversation to establish goals and address the patient’s barriers. The cue card prompted the team to early action planning for extubation during interprofessional rounds, thereby reducing ALOS of post-cardiac surgery patients in the CTICU.*

March 2022:

- The CTICU Task Force revised the ERAS protocol to allow extubations to be performed by two licensed professionals: an advanced practice provider and RN,

two RNs, or an RN and an RT. Previously, RT had to be present for every extubation.

*Impact Statement: By delegating the task of extubation to other members of the care team, the wait times and delays associated with the availability of RTs were minimized. This resulted in the timely extubation of patients and contributed to a reduction in the ALOS of post-cardiac surgery patients in the CTICU.*

- Ms. Ramos-Mupo increased the par level of Bair Huggers™ (warming device) in the CTICU to address hypothermia.

*Impact Statement: Maintenance of normal core temperature facilitated early extubation and reduced ALOS of post-cardiac surgery patients in the CTICU.*

April 2022:

- The CTICU Task Force reeducated the CTICU interprofessional team, consisting of nurses, providers, RTs, and leadership, on the revised ERAS protocol to include the following new updates:
  - Extubation can be done by two licensed professionals: advanced practice provider and RN, two RNs, or an RN and an RT
  - Fast track patients: Sedation turned off after one hour upon arrival to the CTICU
  - Criteria for a successful extubation

*Impact Statement: By extending the responsibility of extubation to other members of the care team and setting explicit criteria for the extubation process, the delays related to the availability of RTs were minimized. Successful extubation led to timely discharge and reduced ALOS of post-cardiac surgery patients in the CTICU.*

- The CTICU Task Force communicated the changes during morning and evening nursing huddles; interprofessional huddles attended by cardiac fellows, residents, advanced practice providers, clinical nurses, attendings, and respiratory therapists; and the CTICU Unit Practice Council meeting.

*Impact Statement: Transparent and widespread communication fostered buy-in from stakeholders. When team members were informed about the reasons behind the revised ERAS protocol and its benefits, they supported and embraced the change. This buy-in resulted in early extubation and reduced ALOS of post-cardiac surgery patients in CTICU.*

May 2022:

- By May 31, 2022, the interprofessional team in the CTICU fully implemented the revised ERAS protocol on early extubation, a critical component in the interprofessional plan of care of post-cardiac surgery patients.

○ **Key references:**

Ellis, M. F., Pena, H., Cadavero, A., Farrell, D., Kettle, M., Kaatz, A. R., Thomas, T., Granger, B., & Ghadimi, K. (2021). Reducing Intubation Time in Adult Cardiothoracic Surgery Patients With a Fast-track Extubation Protocol. *Critical Care Nurse*, 41(3), 14-24. <https://doi.org/10.4037/ccn2021189>

Richey, M., Mann, A., He, J., Daon, E., Wirtz, K., Dalton, A., & Flynn, B. C. (2018). Implementation of an Early Extubation Protocol in Cardiac Surgical Patients Decreased Ventilator Time But Not Intensive Care Unit or Hospital Length of Stay. *Journal of Cardiothoracic and Vascular Anesthesia*, 32(2), 739-744. <https://doi.org/10.1053/j.ivca.2017.11.007>

**Outcome**

