

Implementation of CTOR Nursing Role for ECMO Cannulation in the Cardiac Intensive Care Unit



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Background

- Cardiac arrest in the pediatric cardiac intensive care unit (CICU) leads to significant morbidity and mortality.
- Improving the quality of CPR, including decreased duration of chest compressions has been shown to improve post-arrest outcomes.
- Extracorporeal cardiopulmonary resuscitation (eCPR) is used frequently in the CICU to provide early return of circulation to decrease cardiac ischemia and mitigate end organ damage.

Targeted Area of Improvement

- **Global Aim:** Reduce patient harm by decreasing duration of CPR
- The QI team identified that the time period from arrival of the offsite CTOR team to start time of the ECMO procedure as an opportunity for improvement
- **Outcome measure:** Time (minutes) from ECMO page to cannulation for all eCPR.
- **Smart Aim:** To decrease aggregate page to cannulation time by 10 minutes within one year.
- An 11 month baseline period was compared to an 18 month implementation period.

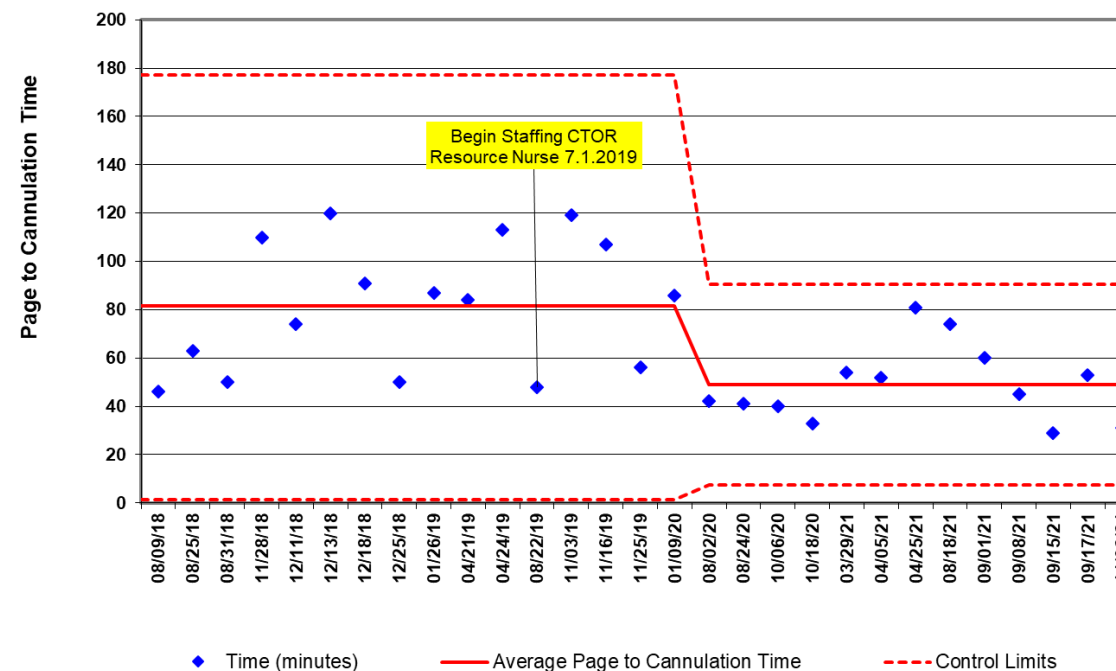
CTOR Nursing Role Development

- Hypothesis: Creation of new role would decrease page to cannulation time.
- CICU nursing role that, upon activation of ECMO, is tasked with prepping the patient and environment enabling immediate surgical intervention upon arrival of CTOR staff.
- Specific tasks developed for this role included:
 - Retrieval of predefined surgical equipment
 - Placement of defibrillation and bovie pads on patient, and surgical site preparation
 - Coordination and supervision of sterile chest compressors utilized during the procedure
- Implemented mandatory staffing of a CTOR trained CICU nurse when CTOR staff is offsite, including all nights, weekends, and holidays.

Implementation

- CICU nurses with >2 years of experience were encouraged to apply.
- Successful applicants received education through module and simulation experience training facilitated by CTOR RNs.
- Mandatory continuing education is provided quarterly to maintain competencies and address practice changes.
- This nurse would be without a patient assignment, often functioning as a resource or charge nurse.

X-Chart
Page to Cannulation Time for Cardiac ECMO
Impact of the CTOR Resource Role



Results

- There were 11 eCPR episodes during the baseline period and 18 during the intervention period.
- Control chart: Shift in centerline at first of seven consecutive episodes with mean time below baseline mean: represents a **significant reduction in mean page to cannulation time.**
- The mean time prior to the CTOR nursing role was 81 minutes ± 27 versus after implementation was 58 minutes ± 26, p = 0.03.

Conclusions

- Implementation of CTOR nursing role in the CICU was associated with reduction in time of page to cannulation in patients receiving eCPR.
- Further studies are necessary to see if this reduction in time is correlated with improved patient outcomes.

Future Modifications

- In-house evening coverage of CTOR team.
- Modification of staffing for role in CICU to allow for bedside nurses with patient assignment to be designated as CTOR nurse for shift.