



Children's Hospital Colorado
Heart Institute

Affiliated with
University of Colorado
Anschutz Medical Campus

Escalation of Care Bundle Improves Outcomes in the Cardiac Progressive Care Unit

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Background

Patients who have an emergent transfer to the ICU, defined as those needing inotropes, intubation, ECMO, 60 ml/kg total fluid bolus or developing cardiac arrest, within 1 hour of transfer to the ICU, have been shown to have worse outcomes.

Escalation of care interventions have demonstrated effectiveness at decreasing codes outside the ICU and decreasing emergent transfers (ET) to the ICU.

Prior to 2021, the cardiac step-down unit at Children's Hospital Colorado (the Cardiac Progressive Care Unit) lacked a standardized process for escalation of care.

Objectives

The escalation of care bundle was developed and implemented with the goal of reducing both codes outside the CICU and emergent transfers.

Primary Objectives:

- 25% reduction in Cardiac Progressive Care Unit (CPCU) cardiac arrest
- 25% reduction in Emergent Transfers to the CICU

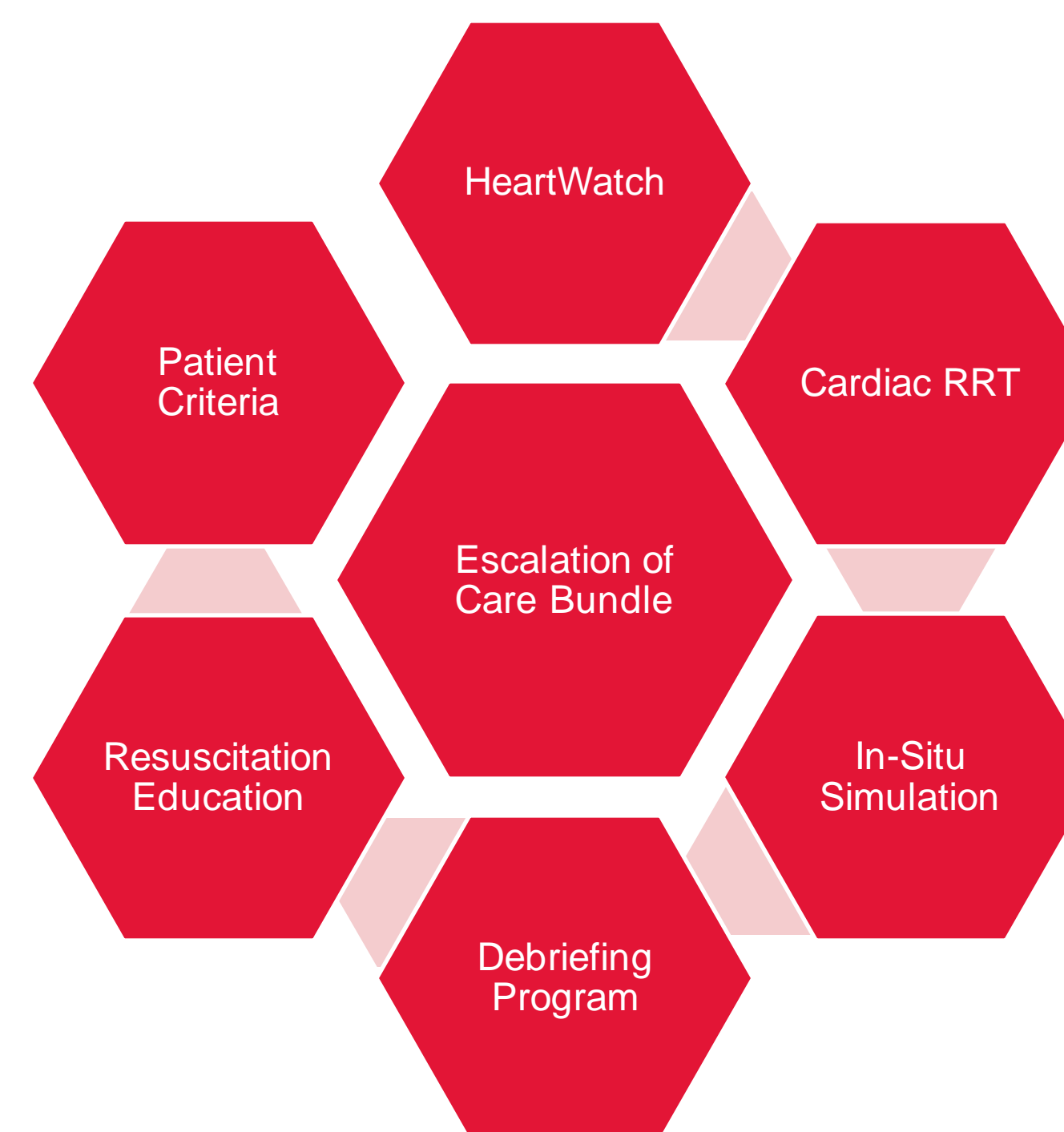
Secondary objective

- Increased utilization of cardiac rapid response team (RRT) process

Intervention

Escalation of Care Bundle:

- CPCU patient admission criteria created by a multidisciplinary leadership team
- HeartWatch*: Implementation of a program focused on early identification of high-risk patients and multidisciplinary safety huddles to encourage a shared mental model
- Creation of Cardiac RRT team/process
- Implementation of In-Situ Simulation: Rolling Refresher and First 5-minute Mock Code Drills
- Creation of a formalized debriefing team to review CPCU codes (including cardiac arrest and medical emergency team activations) and follow-up on system level defects identified by team
- Quarterly Escalation Flyers sent to all CPCU team members to review events, updates, and lessons learned



Conclusions

Creation and implementation of a standardized escalation of care bundle led to a 37% reduction in CPCU cardiac arrest and 15% reduction in emergent transfers.

The implementation of an escalation of care bundle demonstrated feasibility.

Patient admission criteria was successfully implemented.

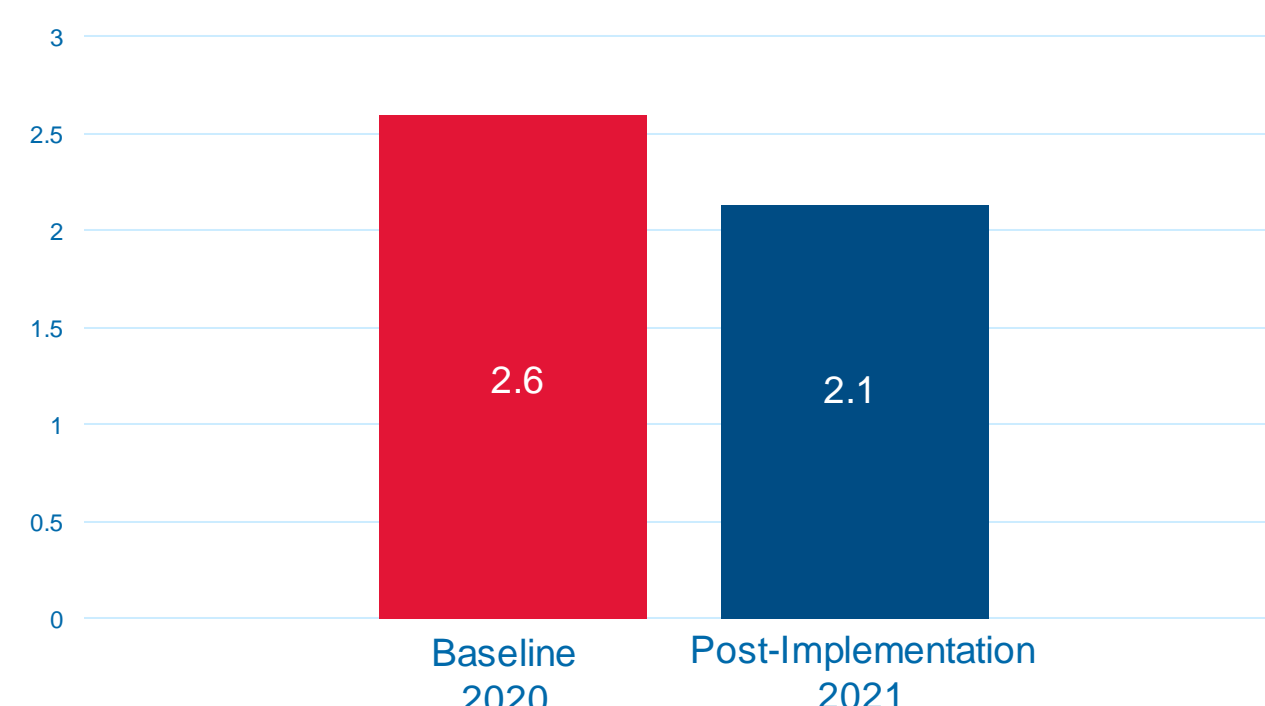
The redesign of the cardiac RRT process resulted in a significant increase in utilization of cardiac RRTs and a 25% decrease in the number of patients who were transferred to the CICU after an RRT.

110 in-situ simulations were performed and 90% of all codes were debriefed.

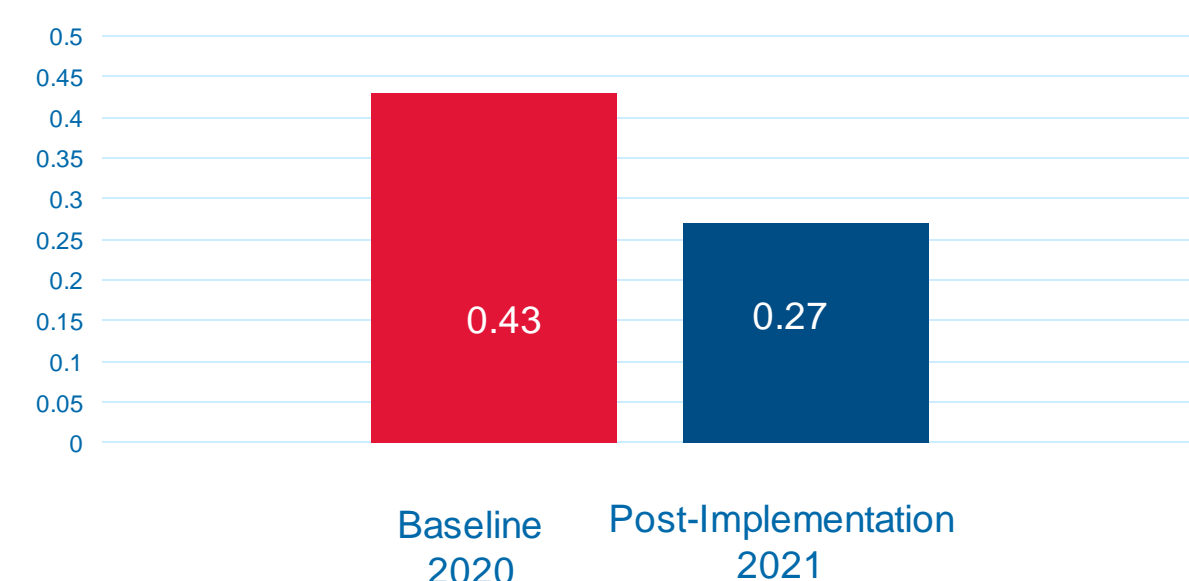
The implementation of the HeartWatch Program has helped create a shared mental model by identifying high-risk patients, discussing etiologies and early warning signs of decompensation and communicating high-risk patients to the CICU.

Results

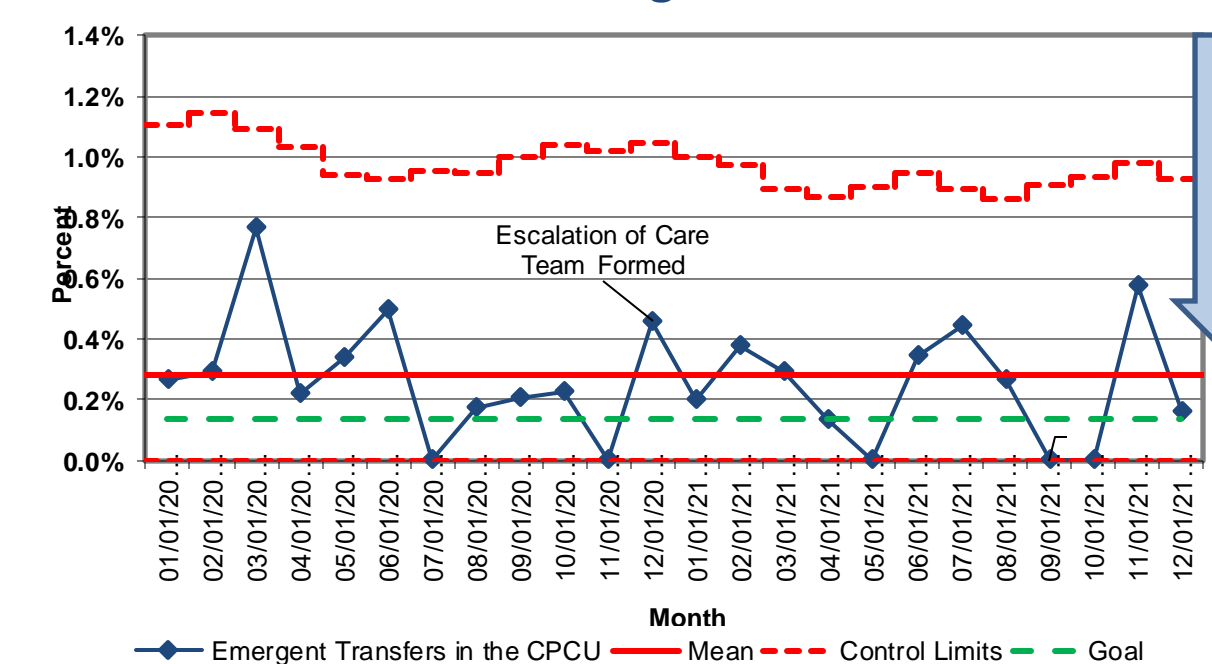
Emergent Transfers per 1000 patient days



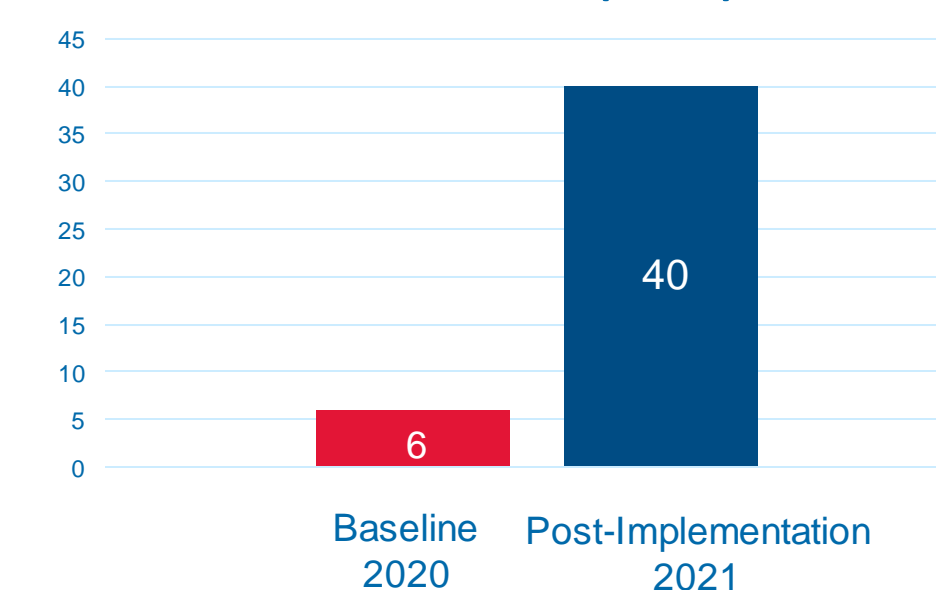
CPCU Cardiac Arrest per 1000 patient days



CPCU Emergent Transfers



Cardiac RRTs (Total)



Next Steps

- Expand in-situ simulation participation to all disciplines.
- Develop auditing tool for HeartWatch to assess reliable utilization of tool and assess for barriers to implementation.
- Focus on sustainability.

Acknowledgements*

- Alex Birely and the team at Children's Health in Dallas, TX for the concept and collaboration of HeartWatch.
- PAC3 for the opportunity to attend the QI Education Course for the HeartWatch project.

Key Measures	Definitions	Baseline (2020)	Goal	Progress (2021)
Outcome	Incidence of Cardiac Arrest in CPCU (Per 1000 pt. days)	0.43	0.32	0.27
	Incidence of Emergent transfers from CPCU to CICU (Per 1000 pt. days)	2.6	1.95	2.13
Process	# of RRTs in CPCU	6	Increase	40
	% of RRT that transfer to CICU	100%	60%	75%
	Code/Emergency Debriefs	3	100% events	10/11 (90%)
	In-Situ Simulations	9	120	110