Cardiac Arrest Prevention (CAP) Bundle Implementation in the Pediatric Cardiac Intensive Care Unit

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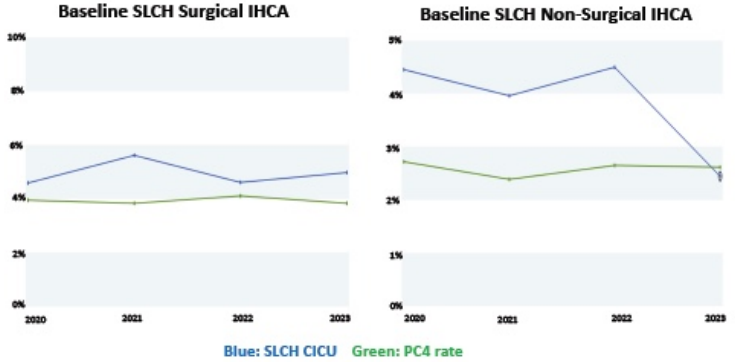
Introduction

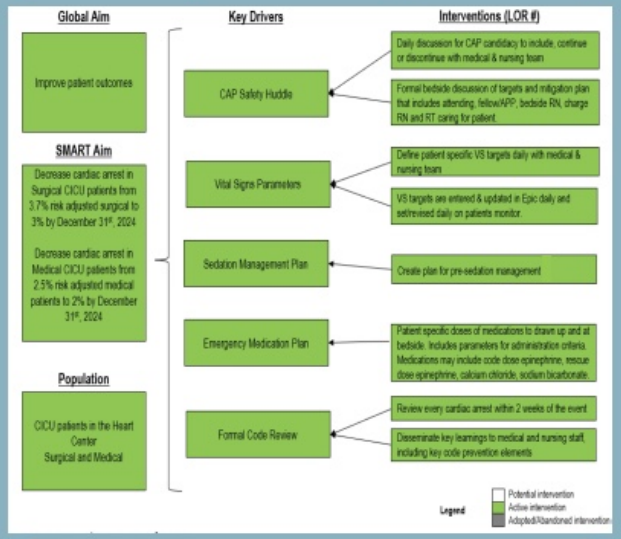
- Risk for In-hospital cardiac arrest (IHCA) is higher in children with cardiac disease than those without (1).
- Risk adjusted IHCA incidence rates at St. Louis Children's Hospital's (SLCH) CICU have been above PC4 aggregates.
- The Cardiac Arrest Prevention (CAP) bundle is proven to reduce IHCA incidence rates (2).
- The CAP bundle was implemented in the SLCH CICU in July 2024 with the goal of reducing IHCA incidence rate below the PC4 aggregate.



Methods

- Bundle: Multidisciplinary "huddle" with discussion of expected modes of deterioration, identification of vital sign targets, contingency planning, and ordering of rescue meds + IHCA review
- All CICU admissions from July 2024 to January 2025 were reviewed using the EMR and initiation on the CAP Bundle was confirmed.
- SLCH IHCA incidence rate was compared to the PCR aggregate using the available PC4 reporting platform.

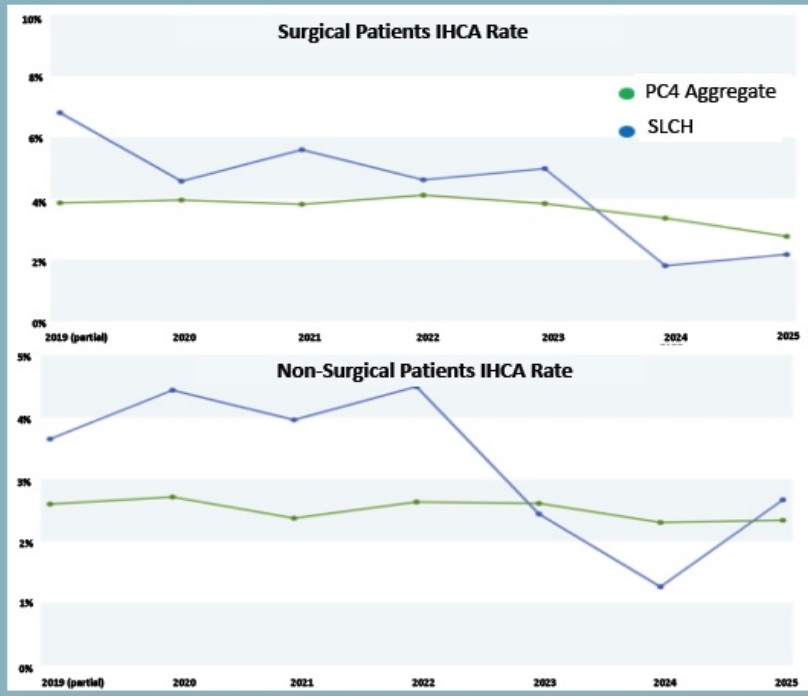
Key Driver Diagram



Lessons Learned

- CAP bundle implementation reduced IHCA incidence rates among all groups in year one.
- Low IHCA incidence rate sustained in surgical patients in year two, possibly due to addition of the CAP bundle in post-operative hand off.
- IHCA incidence rates rose in year two for non-surgical patients, though still well below prior years. This could represent lack of timeliness of CAP bundle initiation, which is currently being addressed with recent interventions with CAP bundle compliance.

Results



- Year one: risk adjusted IHCA incidence rate in surgical patients decreased from 4.97% (O/E 1.73) to **1.81%** (O/E 0.63), and in non-surgical patients decreased from 2.44% (O/E 0.94) to **1.26%** (O/E 0.49)
- Year two: risk adjusted IHCA incidence rate in surgical patients was sustained at **2.16%** (O/E 0.75), while in non-surgical patients, the IHCA rate rose to **2.67%** (O/E 1.03)
- CAP bundle compliance increased to 75% and has been sustained at this rate from May 2025 to present.

References

1. Alten JA, Klugman D, Raymond TT, et al. Epidemiology and outcomes of cardiac arrest in pediatric cardiac ICUs. Pediatr Crit Care Med. 2017; 18(10):935-943.
2. Alten J, Cooper DS, Klugman D, Raymond TT, Wooton S, Garza J, Clarke-Myers K, Anderson J, Pasquali SK, Absi M, Affolter JT, Bailly DK, Bertrandt RA, Borasino S, Dewan M, Domnina Y, Lane J, McCammond AN, Mueller DM, Olive MK, Ortmann L, Prodhan P, Sasaki J, Scahill C, Schroeder LW, Werho DK, Zaccagni H, Zhang W, Banerjee M, Gaies M; PC4 CAP Collaborators. Preventing Cardiac Arrest in the Pediatric Cardiac Intensive Care Unit Through Multicenter Collaboration. JAMA Pediatr. 2022 Oct 1;176(10):1027-1036.