Decreasing Cardiac Arrests in the Pediatric Intensive Care Unit

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Decreasing Cardiac Arrests in the Pediatric Intensive Care Unit

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Cardiac arrest (CA) occurs in 1.4-2.2% of PICU admissions, and up to 55% of patients do not survive after CA. Cardiac admissions to the PICU have higher risk.

In 2016 and 2017, CMH PICU CA increased.

Cardiac arrest events/1000 patient days
2014 = 4.7 CA events/1000 patient days
2015 = 3.3 CA events/1000 patient days
2016 = 3.6 CA events/1000 patient days
2017 = 6.5 CA events/1000 patient days

Cardiac arrests to the PICU have higher risk.
- CA occurs in 3.1% of cardiac admissions
- 4.8 CA events/1000 cardiac patient days

High-risk cardiac patients targeted for CAP bundle inclusion include:
1. Neonates undergoing cardiopulmonary bypass for repair of congenital heart disease
2. Neonates/infants undergoing surgery involving a shunt or pulmonary artery banding
3. Patients with cardiac disease who are intubated within 4 hours of PICU admission
4. Any other cardiac patient deemed high-risk by the team

Project Aims
1. Develop CAP bundle for cardiac PICU patients
2. Decrease cardiac patient CA events by 25%
3. Develop a multidisciplinary review process for all PICU CA
4. Develop a bundle specific to non-cardiac PICU patients after evaluation of CA events

Preliminary Results: CA Events

Cardiac arrest rate: Cardiac Patients
2018 = 1.7 events/1000 patient days
2018 = 1.7 events/1000 patient days
2018 = 1.7 events/1000 patient days

Preliminary Results: CA Review

12/13 events (92%) have been reviewed, occurring an average of 13 days from the event.
Review pearls are presented to the multidisciplinary care team upon completion of review.
Event trends are presented in scheduled updates.

Primary outcome: CA events/1000 patient days in all PICU, non-cardiac, and cardiac patients

Outcome Measurements

PICU Cardiac Patient CAP bundle
1. Bedside safety huddle twice daily
2. Discussion of vital sign ranges and ensuring ranges are programmed into the bedside monitor
3. Discussion of interventions for noxious stimuli
4. Discussion of bedside code medications
5. Timely multidisciplinary review of CA events

Patient Population

High-risk cardiac patients targeted for CAP bundle inclusion include:
1. Neonates undergoing cardiopulmonary bypass for repair of congenital heart disease
2. Neonates/infants undergoing surgery involving a shunt or pulmonary artery banding
3. Patients with cardiac disease who are intubated within 4 hours of PICU admission
4. Any other cardiac patient deemed high-risk by the team

Non-cardiac patients

Other

Background

Patient eligibility is determined by the care team, and confirmed at twice daily multi-disciplinary huddle.

Outcome Measurements

Next Steps

The current PICU CA decrease is likely related to several factors including CAP bundle implementation.
Work remains to determine bundle component utility, improve compliance, and formalize event reviews.
Further review of non-cardiac CA is required to determine high-risk populations.