

PAEDIATRIC RAPID RESPONSE TEAMS. JOURNAL CLUB FEB 2008.

BACKGROUND.

American study by Sharek et al., published in JAMA in Nov 2007.

One of six strategies in the 100,000 lives campaign to decrease the numbers of preventable deaths in the United States was the implementation of Rapid Response Teams.

These were multidisciplinary teams most frequently consisting of ICU trained personnel who were available 24/7 for evaluation of patients not in ICU who develop signs or symptoms of clinical deterioration.

In adults it has shown a 67% reduction in cardiopulmonary arrests outside of ICU and a reduction in mortality by as much as 35%.

Research has revealed that adults often had evidence of physiological deterioration several hours before cardiopulmonary arrest. This would be a window of opportunity to identify and treat.

Survival rates were poor.

Evidence for this window of opportunity also exists for children.

Survival rates for paediatric inpatients following arrest is poor – 34% surviving 24 hours, 27% surviving to discharge and 15% surviving 1 year.

There have been 2 previous published studies in Melbourne and Cincinnati which looked at arrest rates and mortality.

In Melbourne there was a non-significant decrease in both.

In Cincinnati there was a decrease in code rates but no difference in hospital wide mortality.

The goal of this study was to evaluate the effect of Rapid Response Team implementation on hospital-wide mortality rates and code rates outside of ICU.

METHODS.

Cohort study in Lucile Packard Children's Hospital – 264 bed quaternary hospital. Period studied was Jan 2001 - Mar 2007 (Jan 2001 – Aug 2005 = pre-intervention, Sept 2005 – Mar 2007 = post-intervention).

Children had spent at least 1 day on a non-obstetric, non-nursery, non-ICU ward.

The team consisted of a physician (ICU), experienced paediatric ICU or cardiac ICU nurse, ICU respiratory therapist and nursing supervisor.

Information was given as to the circumstances appropriate to activate the RRT following which they would initiate an evaluation within 5 minutes of the call, write orders necessary for any diagnostic studies and therapeutic interventions, discuss management with the primary physician and determine the optimal location for the patient's care.

Criteria to activate the RRT included:

- Any staff member worried about a patient.
- Acute changes in respiratory rate.
- Acute changes in oxygen saturations.
- Acute changes in blood pressure.
- Acute changes in heart rate.
- Acute changes in level of consciousness.

Primary outcome measures were hospital-wide mortality rates and code rates outside of the ICU. A code outside of the ICU was defined as any patient requiring tracheal intubation, chest compressions or both.

Data describing the reasons for RRT activation, the actions taken by the RRT once activated and the patient disposition after RRT input were collected.

RESULTS.

In the 19 months there were 143 activations – the most common reason being respiratory distress with the most common intervention being basic airway support and the patient then being transferred to PICU.

A significant decrease in hospital-wide mortality rate of 18% occurred after implementation of RRT.

Code rates outside of ICU per 100 eligible patient days decreased by 71.2% after RRT.

During the 19 month period it was estimated to have resulted in 32.9 lives being saved.

COMMENT.

There was a significant reduction in both mortality and code rates.

Two explanations were suggested for this – the hospital serves a particularly high-risk population of hospitalized children who are therefore at higher risk for codes. Also the post-intervention period was longer and the diffusion of the intervention takes several months to occur and to gain the full impact.

Results may be related to education rather than to the team's activity.

JOURNAL CLUB DISCUSSION.

- Study was performed in a quaternary hospital whereas our hospital serves as a tertiary unit.
- The RRT team seemed to have been performing assessments and interventions currently undertaken in UHW by the general paediatric registrars with a crash team in place for resuscitation situations. If a RRT was to be set up this would have implications for general paediatric training.
- As the RRT in the study was made up of PICU staff if this was to be set up in UHW it would have huge implications on the staffing levels needed in the unit. Also as the RRT included an ICU physician would this mean resident consultants? Also ICU respiratory therapists would not be available on our team.
- As previous work on Early Warning Scores has not provided any robust data to which we could refer clear criteria would have to be set for team activation.
- More information needs to be gathered for the UHW paediatric population – our code rates, mortality rates, number of "crash" team activations and reasons behind calling the "crash" team. It has been suggested that this should be a future audit.
- Also it has been suggested that it would be worthwhile looking at nursing observation charts to review observation charting, especially in those children that go on to have "codes".