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Title

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Pediatric Rapid Response Team Implementation and Outcomes in a Children's Hospital within a Mixed Academic Health Center

UC Davis Pediatrics

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Background

Rapid Response Teams (RRTs) are teams of healthcare providers called to patient bedside for unexpected or sudden changes in patient conditions.¹ Such teams are intended to intervene before patients experience Sudden Adverse Events (SAEs) or require 'code blue' activation. Markers such as abnormal vital signs raise concern for providers and patient families as these acute changes may precede cardiopulmonary arrest (CPA).² A mechanism of activation to urgently introduce additional providers to bedside allows for patients to be seen before patient deterioration. A systematic review noted that "rapid response systems were associated with a reduction in hospital mortality and cardiopulmonary arrest."³

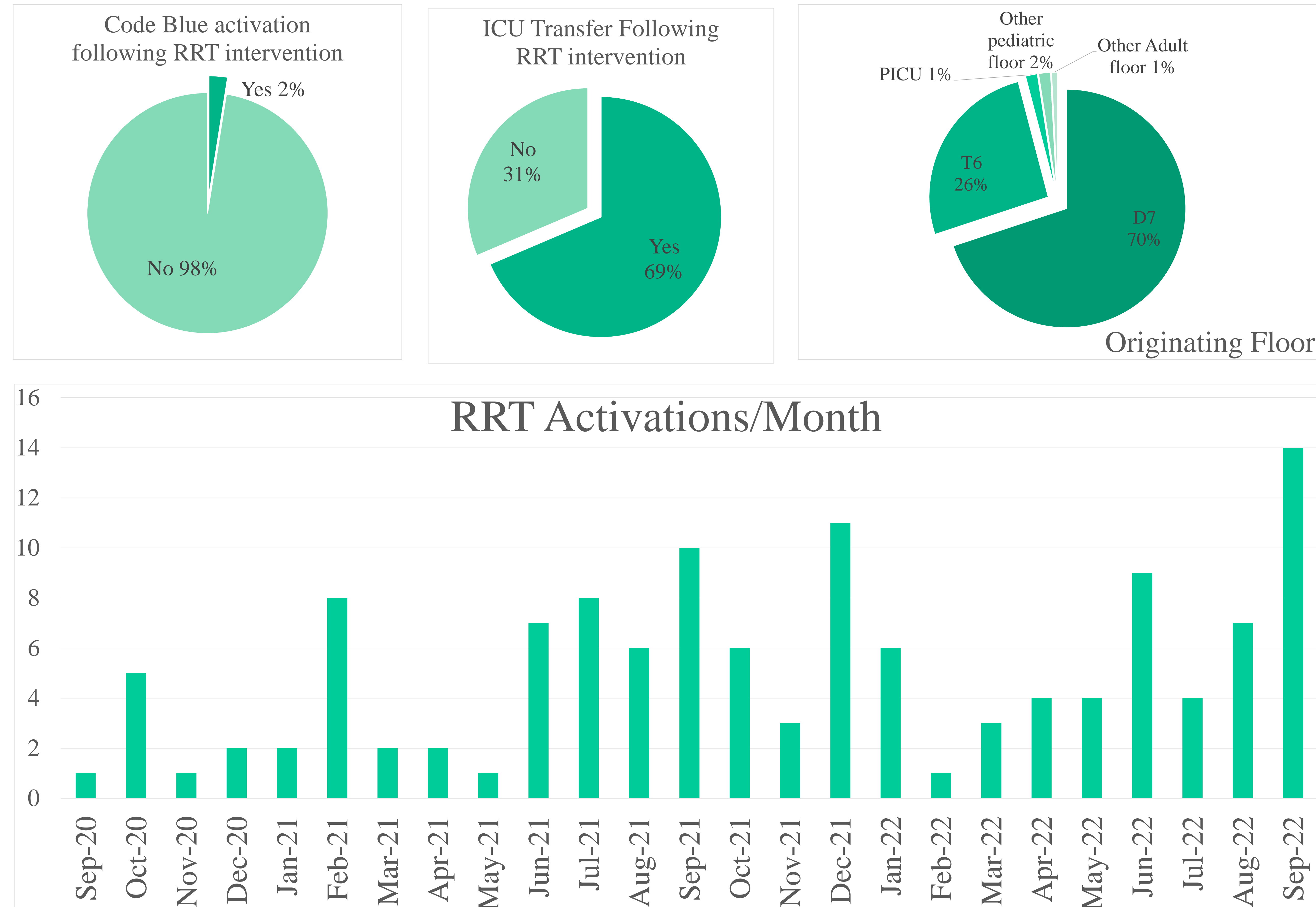
Pediatric patients have varying differences in care from an adult patient population. As a result, pediatric-specific RRTs have often been implemented in standalone pediatric hospitals. However, no existing literature has studied the generalizable implementation of a pediatric RRT in the setting of a dual-demographic hospital that cares for both pediatric and adult patient populations.

Methods

UC Davis implemented its Pediatric RRT in September 2020 and data collection has been ongoing since.

We reviewed operator call logs that documented RRT activations between Sept 2020 and Sept 2022. Logs indicated patient name, MRN, floor of activation, date/time. We employed RedCap to record data including but not limited to interventions (i.e. HFNC, antiepileptics, continuous albuterol), ICU transfers, patient floor, and documentation adherence associated with MRNs during activations.

Results



The frequency of pediatric RRT activations at our institution have increased over the 2-year period studied and may follow a seasonal or cyclic pattern throughout the year. The minimum number of activations in one month was 1, and the maximum number in one month was 14.

D7 and T6 were the originating floor for nearly all RRT activations during the period studied, with a small number of RRT activations originating on other floors.

Nearly 70% of RRT activations resulted in transfer to ICU-level care.

In the 2-year period studied, 3 RRT activations were followed by a code blue activation within the 12 hours after the RRT activation.

Summary & Conclusions

Given the increase in RRT activations over time, further study may be directed at understanding the cause of this. It may be related to increasing awareness of the RRT and its function or may be related to changes in patient-related factors such as increasing medical complexity that led to greater RRT activations.

As dedicated pediatric units, D7 and T6 account for the vast majority of RRT activations. However, the small number of activations on other floors may suggest that further awareness of the pediatric RRT and its function may lead to more activations among pediatric patients boarded in units outside of D7/T6.

Code blue following RRT activation was relatively rare. This may suggest that pediatric RRT activations are an important mechanism to avoid code blue activation as a patient begins to clinically decline. This has been established within the literature with regard to adult rapid response teams, however further investigation is necessary to determine if this is applicable to pediatric RRT activations at our institution. Further, the majority of RRT activations (~70%) resulted in transfer to ICU-level care, suggesting that pediatric RRT activations may be an important bridge to ICU-level care. It may also suggest that RRT activation can help to avoid transfer to ICU-level care among some patients, via early recognition and intervention of clinical decline.

Institutional protocol dictates that reason for RRT activation is documented, however this was not recorded for the purposes of our study. Investigating the reason for RRT activation within this study period may help better understand the demands of our hospital population and may create opportunities to further refine the services and function of the pediatric RRT.

Acknowledgements

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¹ Arashin KA. Using the synergy model to guide the practice of rapid response teams. *Dimens Crit Care Nurs.* 2010;29(3):120-4.

² Hosp Pediatr. 2014 May;4(3):135-40. doi: 10.1542/hpeds.2013-0062.

³ Maharaj R, Raffaele I, Wendon J. Rapid response systems: a systematic review and meta-analysis. *Crit Care.* 2015;19(1):254. Published 2015 Jun 12. doi:10.1186/s13054-015-0973-y