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Enhancing Paediatric & Adult Resuscitation Performance Through Flowchart Driven Targeted Training in the Critical First Five Minutes

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ABSTRACT

Background

Early recognition of cardiac arrest and delivery of high-quality early resuscitation are critical for survival [1]. Performance during this phase remains inconsistent in healthcare settings [2]. Simulation-based multidisciplinary team (MDT) training has shown superior outcomes compared to traditional lecturing, especially when monitored by measurable key performance indicators (KPIs) [3]. Data collected by Resuscitation Officers from the Hamad International Training Centre revealed KPIs not being met (Table 1), prompting a revised training method at Hamad Medical Corporation's (HMC) hospitals, in Qatar. This study aimed to evaluate the introduction of a MDT training program integrating response algorithms emphasizing the first five minutes on resuscitation KPIs in simulated clinical settings.

Methods

A pre-/post-intervention study was conducted with 80 participants randomly allocated from newly formed MDT as per the shift roster at a newly opened HMC hospital providing diverse services. Each MDT consisted of two physicians and six nurses with defined roles, all with over 5 years of post-registration experience and qualified in Immediate Life Support or Paediatric Life Support. (European Resuscitation Committee 2021 guidelines). Performance was evaluated before and after the introduction of the revised training model. The initial sessions were skills-based (90 minutes of Basic Life Support airway and defibrillation) followed by a cardiac arrest simulation (30 minutes), latter sessions of the same duration were entirely simulation-based with coaching and emphasis on rapid assessment, timely recognition, and prompt initiation of interventions within the first five minutes of collapse, reinforced by the implementation of response algorithms (Figure 1). Data collection focused on six KPIs (Table 1).

Results

Implementation of the MDT training program and response pathway algorithms replacing solely skills training, resulted in improvements across all KPIs (Table 1).

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Conclusion

This training with algorithms improved performance across KPIs highlighting the significance of integrating clear response pathways and defined roles.

Keywords

Resuscitation, Training, Simulation, Qatar, First 5 minutes

TABLE 1 - Statistical analysis of the 6 Key Performance Indicators in response to cardiac arrest (*Significant if p < 0.05 highly significant is p<0.001)**

Key Performance Indicator (KPI)	N (Pre-intervention)	N (Post-intervention)	Pre-mean Rank	Post-mean Rank	U	p-value
1. Time to Recognize Absence of Breathing & Deliver 5 Breaths (≤30 s)	80	80	55	82	1289	<0.001
2. Code Blue/White Activation Time (≤1 min)	80	80	57	80	1084	0.003
3. First Chest Compression Attempt (≤30 s)	80	80	60	77	1190	0.012
4. Defibrillator Arrival Time (≤3 min)	80	80	62	75	1300	0.029
5. Time to First Defibrillation Shock (≤1 min)	80	80	58	79	1275	0.008
6. Code Blue/White Team Arrival Time (≤5 min)	80	80	61	76	1350	0.045

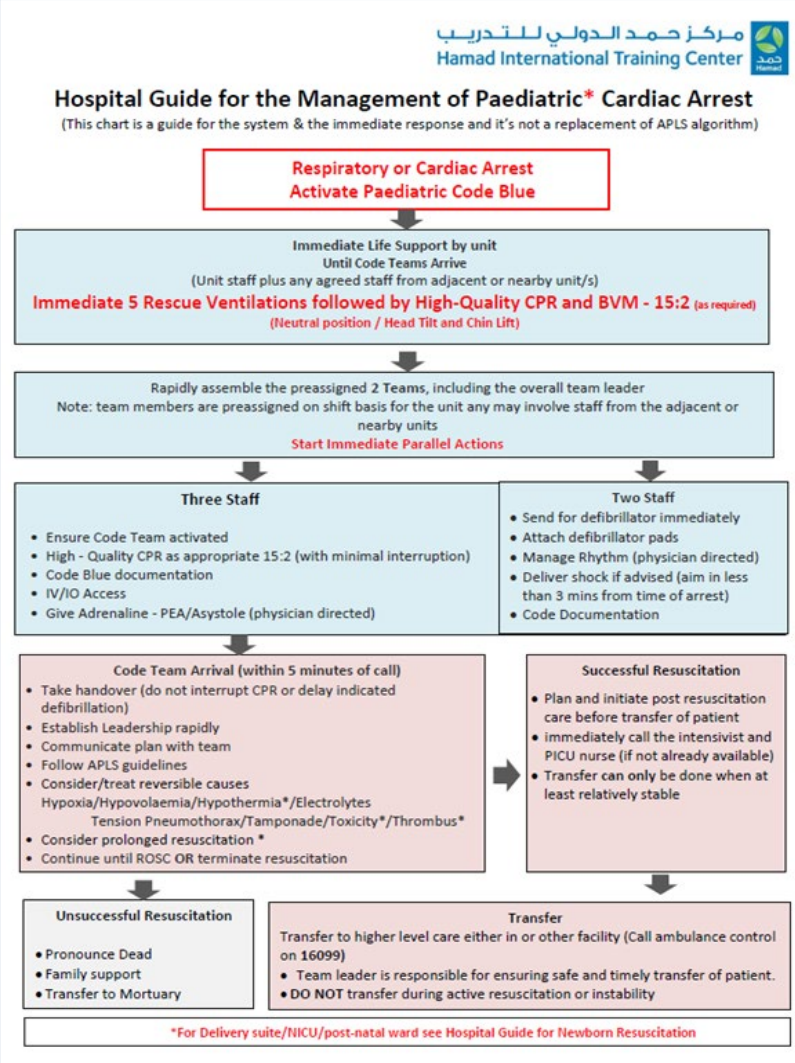

FIGURE 1 - Response Pathway for Paediatric Cardiac Arrest

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Author contributions

All authors contributed equally and validated the final version of record.

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Declarations

Conflicts Of Interests

The Authors declare that there is no conflict of interest.

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Registration

No registration applicable.

Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Ethical approval

The study was approved as Quality improvement project by Director of Hamad International Training Centre.

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