

Research Article

Clinical Audit of Pediatric Advanced Life Support (PALS) Guideline Adherence during Emergency Resuscitation

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are current American Heart Association and American Academy of Pediatrics guidelines for the recognition and treatment of Pediatric Respiratory Emergencies, Shock, Bradycardia, Tachyarrhythmias, Cardiac Arrest and Post-Cardiac Arrest Care for patients up to 18 years of age (excluding newborn infants) [3]. It involves systematic evaluation, good cardiopulmonary resuscitation, effective ventilation, rhythm recognition, prompt defibrillation, proper drug giving, vascular access, recognising reversible causes and team coordination [4].

Applying the PALS guidelines is especially critical in emergency resuscitation as the success of the treatment is dependent on both the choice of treatment but also on the timing, dose, sequence, and quality of the treatment [5]. The paediatric cardiac-arrest algorithm focuses on the timely initiation of cardiopulmonary resuscitation (CPR), oxygenation and ventilation

measures being implemented and re-audit on the same pre-defined standards. All paediatric patients aged from one month to 18 years who were admitted to the Pediatric Emergency Department for emergency resuscitation for respiratory failure, shock, symptomatic bradycardia, unstable tachyarrhythmia or cardiopulmonary arrest were included in the audit. The majority of newborns who needed resuscitation were excluded as they were afterwards treated according to neonatal resuscitation guidelines. Sample size was determined for estimation of a single proportion with an expected PALS guideline adherence rate of 50%, a 95% confidence level and an absolute precision of 10%. The adherence rate was chosen to be 50% as there was no reliable estimate of adherence available locally, and this was the maximum sample size needed.

The sample size was calculated using the formula:

events were recorded in the paediatric emergency registers, resuscitation registers, nursing notes, medication registers, defibrillator registers and patient records. In cases where training auditors could be done without disrupting patient care, they directly observed emergency resuscitations. Structured checklist was used to collect data on the quality of chest compression, rhythm analysis, shock timing, and medication and airway management. A unique audit identification number was given to each case. No patient and staff identifiers were entered into the analytical database. The records were independently audited by another auditor for consistency with a proportion. All disagreements between reviewers were discussed with a senior pediatric or emergency-medicine specialist. In the first phase, 96 eligible pediatric resuscitation events were reviewed to the standards of the PALS. In the first phase, 96 events were assessed for pediatric resuscitation to the PALS standards. Adherence was determined for each event (and for overall adherence). The baseline audit revealed some standard errors

Unstable TACHYARRHYTHMIA	7 (7.3)	7 (7.3)
Day-SHIFT RESUSCITATION	58 (60.4)	61 (63.5)
Night-SHIFT RESUSCITATION	38 (39.6)	35 (36.5)
Pals-CERTIFIED TEAM LEADER PRESENT	44 (45.8)	72 (75.0)

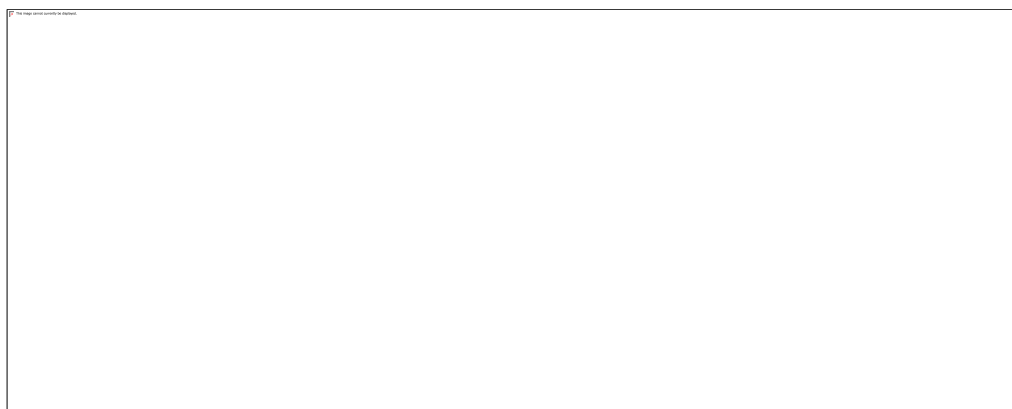
Values are presented as mean $\pm$ SD or n (%).

Appropriate Post-Resuscitation Care Provided	54 (56.3)	82 (85.4)	<0.001
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A clearly identified team leader was present in 50 (52.1%) baseline events compared with 83 (86.5%) re-audit events. Role allocation increased from 42 (43.8%) to 79 (82.3%),

while closed-loop communication improved from 38 (39.6%) to 75 (78.1%). The presence of a dedicated timekeeper or recorder increased from 41 (42

Low adherence, <60%	34 (35.4)	3 (3.1)	
Return of spontaneous circulation	48/65 (73.8)	56/67 (83.6)	0.168
Survival to PICU or definitive-care transfer	67 (69.8)	79 (82.3)	0.043
Survival to hospital discharge	45 (46.9)	57 (59.4)	0.082



it varies significantly for shockable versus non-shockable rhythms [17]. The monitor may not attach quickly, or the rhythm may be misinterpreted, delaying defibrillation, epinephrine, or other rhythm specific interventions. This improvement observed suggests that the preparation of equipment and targeted rhythm-recognition training may have been helpful parts of the quality-improvement effort. Assessment of reversible causes increased from 47.9% during the baseline audit to 80.2% during the re-audit. Since it is important to identify reversible causes, as resuscitation may be unsuccessful unless there is a cause such as hypoxia, hypovolemia, electrolyte disturbance, tension pneumothorax, cardiac tamponade, toxins, or thrombosis is recognised and treated [18,19]. Even with the significant enhancement, there was still an underrepresentation of reversible causes of almost 20% of re-audit events. This indicates that

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