

Pediatric Residents' Intubation Competency Through Simulation-Based Training: A Quality Improvement Initiative

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Introduction. Intubation is a critical skill in pediatric emergency medicine, yet many residents report limited procedural exposure. Simulation-based training provides a safe and structured environment to address this gap. Authors of this ongoing quality improvement (QI) initiative aimed to enhance pediatric residents' intubation skills through simulation-based assessment in partnership with the Department of Anesthesiology.

Methods. A total of 24 residents participated (Pediatrics = 17; Med-Peds = 5). Stage 1 of the QI initiative consisted of a didactic seminar led by anesthesiology residents, followed by a skills workshop with four stations: bag-mask ventilation (BMV), oropharyngeal/nasopharyngeal airway placement, laryngeal mask airway insertion, and endotracheal intubation. Outcomes included pre- and post-intervention multiple-choice examinations (MCQs), self-reported confidence surveys, and objective skills assessments evaluated by anesthesiology faculty. Primary outcomes were changes in knowledge, confidence, and intubation competency scores.

Results. Mean pre-MCQ scores were 11.75 (± 3.2) out of 20, increasing to 16.4 (± 2.8) post-intervention ($p < 0.001$). Skills assessment identified lower performance in LEMON assessment, head positioning, and BMV technique. Self-reported confidence in airway management increased from 3.6 (± 2.1) to 7.2 (± 1.5) ($p < 0.001$). Confidence in BMV improved from 5.7 (± 2.3) to 8.5 (± 1.7) ($p < 0.01$), and confidence in intubation increased from 3.5 (± 1.9) to 7.0 (± 1.4) ($p < 0.001$).

Conclusions. Stage 1 of this QI initiative improved both knowledge and self-reported confidence in pediatric airway management among residents. These findings suggest that simulation-based training may enhance short-term competency in pediatric intubation skills. Long-term skill retention will be evaluated in Stage 2 using a delayed post-intervention MCQ following a high-fidelity simulation session.