

Preventing Cardiac Arrest in the Postoperative Congenital Heart Disease Patient: A High-fidelity Simulation Boot Camp for Pediatric Cardiac Critical Care Nurse Practitioners

Objectives: To assess the effect of simulation training on pediatric nurse practitioners' (PNP) ability to identify and treat a low cardiac output state in the postoperative congenital heart disease (CHD) patient. A secondary objective was to assess the effect of simulation training on self-confidence of the PNP in managing an acute deterioration.

Design: Descriptive educational interventional pilot study

Setting: Single university simulation center

Subjects: Acute Care PNPs from multiple academic centers from North America

Interventions: The curriculum was mixed instruction of didactic, case studies, and hands-on high-fidelity simulation, which were based on high complexity cases, eight CHD benchmark procedures, and a mix of lesion specific postoperative complications. An expert opinion survey was conducted to guide the development of the curriculum. In order to cover multiple, high complexity cases, Rapid Cycle Deliberate Practice (RCDP) method of debriefing was utilized for selected high fidelity simulation scenarios.

Measurements and Main Results: Knowledge was assessed with a pre/post-test format (max score 100). A paired-sample t-test was conducted and a statistically significant increase in the post-test scores was detected. [PRE: M= 36.8, SD 14.27; POST: M=56, SD 15.77; $p = .000$]. Time to recognize and treat an acute deterioration was evaluated through the use of high fidelity simulation (results pending). Confidence and satisfaction were evaluated utilizing a validated tool by the NLN. Participants responded to questions using a five-point Likert scale, with higher scores indicating higher levels of quality. The participants reported a high level of satisfaction (M= 4.68, SD 0.30) and performance confidence (M=4.75, SD 0.31) with the simulation experience.

Conclusion: Simulation boot camps have been conducted for physician training and have been shown to be an effective strategy for educating critical care providers. This was a novel approach to educate nurse practitioners from multiple academic centers. There was an overall improvement in knowledge. The PNPs reported satisfaction and confidence in the simulation experience. This instructional method may be useful in other centers.

Key words: simulation; pediatric; congenital heart disease; pediatric nurse practitioner; low cardiac output