

Longitudinal Simulation and Procedural Skills Curriculum for Pediatric Critical Care Nurse Practitioners

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Background

- Pediatric Nurse Practitioners (PNPs) are integral to the function of the Pediatric ICU (PICU). Currently, there is wide institutional variability in their orientation and perceived clinical practice roles and responsibilities.
- Given the complexity of the environment and many learners in the PICU, NPs are inconsistently able to practice procedural skills in the clinical environment or receive formative feedback on clinical skills.
- There is a paucity of literature on simulation education in non-physician PICU team members.

Purpose

- Development and implementation of a longitudinal simulation and procedural skill curriculum for pediatric critical care NPs
- Targeted needs assessment of the PICU NPs demonstrated low levels of satisfaction with NP education and poor attendance at and utilization of dedicated simulation time

Objectives

- Increase NP confidence in critical situations
- Increase perceived knowledge and application of knowledge to clinical practice
- Increase awareness of resource availability and utilization in the ICU environment
- Increase confidence in and numbers of procedures performed
- Increase participation in simulation education by NPs

Participants & Faculty

- NPs working in the PICU and heart center (HC) at St. Louis Children's Hospital participated in this curriculum (n=31, 0.5-20 years of experience).
- Facilitators were PICU and HC faculty and fellows and simulation center staff

Curriculum Development

- Monthly one-hour sessions, alternating procedural skills and simulated cases each month
- Procedural sessions include interactive didactics and hands on practice
- Simulation sessions include two simulated patient encounters, focused on problem identification, appropriate resource utilization and escalation of care, with structured, faculty-led debriefing
- Cases were identified and developed to include scenarios when NPs would be called to a patient bedside in regular clinical practice
- Additional half-day session with procedural skills and simulated clinical encounters was held near the end of the year to allow for maximal participation
- Participating NPs had two options for attendance each month to increase flexibility and allow for smaller groups in each session

Month	Educational Methods	Simulation Scenarios or Procedures
January	Discussion Demonstration, Task Training	Airway Management – bag mask ventilation, airway adjuncts, patient positioning, endotracheal intubation
February	High Fidelity Simulation Reflection	Septic shock Hemorrhagic shock
March	Discussion Demonstration, Task Training	Central venous catheter placement Arterial puncture
April	High Fidelity Simulation Reflection	Tamponade Pulmonary Hypertensive Crisis
May	Discussion Demonstration, Task Training	Airway Management – bag mask ventilation, airway adjuncts, patient positioning, endotracheal intubation
June	High Fidelity Simulation Reflection	VT (Benadryl ingestion) SVT with hemodynamic compromise
August	High Fidelity Simulation Reflection	DKA with cerebral edema Herniation/increased ICP
September	Discussion Demonstration, Task Training	Central venous catheter placement Arterial puncture
October	High Fidelity Simulation Reflection	ETT/tracheostomy obstruction (DOPE) Seizure with respiratory depression
October*	High Fidelity Simulation Reflection Task Training	Hemorrhagic Shock Pulmonary Hypertensive Crisis ETT/tracheostomy obstruction (DOPE) Airway management Central venous catheter placement Arterial puncture Lumbar puncture
November	Discussion Demonstration, Task Training	Lumbar Puncture Chest Tube
December	High Fidelity Simulation Reflection	Cardiogenic shock PEA/cardiac arrest

Post Session Evaluations

This session increased my confidence in patient care	Agree Neither agree nor disagree Disagree	60 (97) 2 (3) 0 (0)
This session increased my knowledge in the care of a deteriorating patient	Agree Neither agree nor disagree Disagree	60 (97) 2 (3) 0 (0)
The content of this session was relevant to my daily practice	Agree Neither agree nor disagree Disagree	62 (100) 0 (0) 0 (0)
Simulation and/or skills-based training is an effective educational method	Agree Neither agree nor disagree Disagree	61 (98) 1 (2) 0 (0)
The session had sufficient time for my learning	Agree Neither agree nor disagree Disagree	61 (98) 1 (2) 0 (0)

Strengths

- Longitudinal design allows for distributed practice
- Simulated patient scenarios and procedure sessions developed specifically for NPs to align with their clinical role in the ICU
- Enhanced relationships between physician and non-physician providers in the ICU

Limitations

- Implemented at a single institution
- Competence was not directly assessed
- Confidence and competence are not always linked
- Longitudinal curriculum and concurrent additional program improvement efforts
- Limited in-unit procedural opportunities persist
- Resource and time intensive

Conclusions

- A longitudinal, simulation and procedural skills curriculum for pediatric critical care NPs increases confidence in clinical reasoning, procedural skills and communication.
- It is a feasible and engaging means of providing ongoing education to an enlarging and vital portion of the pediatric critical care workforce.