Organization: Sinai Hospital of Baltimore

Solution Title: Using Simulation to Improve Performance in Pediatric Cardiopulmonary Arrests

Focus Area: Education, Communication, Pediatrics

Program/Project Description, Including Goals: Following discharge, pediatric patients with an in-hospital cardiopulmonary arrest, only have a 27% survival rate; and 34% of those who do survive will have neurological deficits post arrest (Van Voorhis & Willis, 2009). The initial actions of the staff who respond first to the site of a pediatric code situation are critical. Delays in providing the basic ABC’s (airway, breathing, circulation) lead to poorer outcomes. Since these arrests happen less often in children than in adults, medical professionals tend to have limited experience and comfort providing resuscitation efforts. Fear of not knowing what to do, where and how to use equipment, breakdowns in communication, and the complexity of calculating medication doses are common safety risks that all can lead to poorer outcomes. While BLS and PALS have two year renewal requirements for pediatric healthcare providers, skills retention from these classes has been shown to deteriorate after only four months.

Pediatric code simulation (mock code) has been shown to decrease fear and anxiety, improve communication between physicians and nurses and increase the knowledge and familiarity with pediatric resuscitation guidelines (Hunt, Walker, Shaffner, Miler, & Pronovost, 2008). There is a direct correlation between survival rates (increased by 50%) and more frequent code simulations (Andreatta, Saxton, Thompson & Annich, 2010). Both physician and nursing staff have expressed lack of exposure and practice, increased anxiety levels, and decreased confidence during resuscitation. Literature demonstrates that anxiety can contribute to breakdown in communication, delays in delivering lifesaving interventions and medication errors.

Problem: Based on concerns by the staff, attending physicians, and direct care nurses, a plan to improve comfort knowledge/competence, confidence and communication during a pediatric code was discussed.

Goal: The goal of this program was then established to have 90% of the staff report improved comfort, knowledge/competence and confidence during a pediatric code as evidenced by reports through a survey tool of increased comfort, knowledge/competence and confidence. The overarching question was: In a pediatric population, does simulation process improve staff comfort knowledge/competence and confidence when participating in a pediatric code? Success would be determined by an improvement in staff comfort/ knowledge/ competence and confidence when participating in a pediatric code.

- Baseline data: obtained in March 2013 is presented below.
Process: Using evidence and a P-D-S-A framework, the strategies were to:

- Review evidence-based findings via scholarly articles related to pediatric resuscitation simulation exercises.
- **Survey:** The committee first conducted a survey, using Survey Monkey, to determine staffs comfort levels, knowledge/competence and confidence related to pediatric codes.
- **Survey Questions:** The survey consisted of 9 questions. Four addressed comfort, 4 addressed knowledge/competence, and 1 question addressed confidence. The survey was distributed to nurses, physicians/residents, and respiratory therapists.
- **Scenario Development:** Based on the survey results, develop scenarios that incorporated common pediatric emergencies
- **Conduct Mock Codes:** Scheduled dates and times of when these mock codes would be conducted, who would facilitate then and who would evaluate the scenarios
  - A committee was formed to plan how to establish and institute mock codes within the Children’s Hospital.
  - This committee consisted of direct care nurses, the Clinical Nurse Specialist, the Nurse Educator, Pediatric Attending Physician, Pediatric/PICU Nurse Manger and Clinical Leaders from both the pediatric inpatient floor and the Pediatric Intensive Care Unit.
  - The mock codes occurred twice a month over a one year period.

Solution: The solution is described as follows:

- The mock codes began with a pre-brief that told a brief scenario of the situation. The scenarios had a set length of time with expected actions to be implemented.
- **Ground Rules** were established, such as participants were to go through all the motions (draw fluids, find medications, obtain vital signs) unless it is clear that it is going to take too long and veer the group off of the overall learning objective. Nurses would be at the bedside first and physician/residents were called in shortly after.
- There was a debriefing held after the mock code for participants to express what they felt was done right and where improvement was needed.
- There was a mock code observer handout used to guide the debriefing. The debriefing was always conducted in a constructive manner, enhancing a positive learning environment.
**Measurable Outcomes:** As per the post implementation data below: 1) Participants reported that they were more comfortable with pediatric codes compared to the previous year; 2) There was increased comfort using a bag valve mask during an emergency, setting up for intubation, and using the Broselow tape; 3) Increased competence for drawing up and administering medications was reported; and 4) Physicians reported increased comfort in leading a code.
Sustainability: Several other tools have been instituted to help decrease anxiety and improve staff performance during a code situation. These include an “Equipment Play Day” in which emergency equipment is set up and an open code cart is available for staff to examine. Staff can also calculate and draw up resuscitation medications. There has also been a “Respiratory Play Day” in which intubation equipment, chest tubes, oxygen delivery devices, and arterial blood gas case studies were available for staff review. This allowed for learning in a relaxed environment. Mock codes have been added to the nurses’ annual competencies. The mock codes are held twice a month to ensure all staff can participate.

Role of Collaboration and Leadership: This is a multidisciplinary process that includes direct care nurses, nursing leadership, physicians, and respiratory therapy. The entire group is engaged to create a process that supports the multidisciplinary team to communicate more effectively and become competent with skills in a stressful situation.

Innovation: Changing the culture to one that is truly interdisciplinary is often verbalized but not implemented. Establishing interprofessional education improves skills, ensures that all disciplines are hearing the same information, and improves communication. The enhanced communication promotes patient safety.

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