START

Simulation Training for Assessment, Resuscitation and Teamwork

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Background

  • Eliminate preventable code blue events outside of ICU’s.
• Patient emergencies
  • Not all are preventable.
  • Low frequency high risk events.
• Increase in simulation-based medical education.
Objective

• Implement and evaluate a simulation-based interprofessional educational curriculum to improve inpatient ward teams’ technical and Crisis Resource Management (CRM) skills in caring for a deteriorating pediatric patient.
Methods: In-situ simulations

• **Learners:**
  – Multi-discipline, inpatient, ward-specific healthcare teams.
  – Code blue team (except pharmacy) **NOT** included.

• **Scenario:** Pediatric respiratory and/or cardiac emergencies

• **Competency** areas targeted
  1. Assessment: recognition of deterioration
  2. Medical management: BLS and PALS
  3. Non-technical skills: Crisis Resource Management (CRM), communication, teamwork
Methods: Immediate verbal debriefing

• Performed after the entire simulation.
• Lead learners through purposeful discussion and reflection on the simulated experience.
  • Medical management
  • Teamwork and communication
• Debrief methods to identify learner’s frame and knowledge gaps (advocacy-inquiry, plus-delta).
• Co-facilitation with multiprofessional content experts (MD, RN, PharmD).
Methods: Learner Feedback

- Formative feedback of *team* performance was aided by use of a previously validated assessment tool.
  - Multi-rater feedback
  - Gap analysis
    - Technique for quantifying self-reflection
    - Generated by comparing team self-ratings to faculty observer ratings.
- This written feedback was emailed to participants for later review.
A Multirater Instrument for the Assessment of Simulated Pediatric Crises

Team Performance During Simulated Crises Instrument.

Resident Team Leader: _____________________ Date: ____________________

Please enter a rating for each of the five domains listed below. Descriptions for each rating are provided.

Medical Knowledge:

- **Poor**: No recognition of abnormal cardiac rhythms, unable to assess patient’s cardiopulmonary status adequately. No knowledge of the appropriate means to monitor and treat the above issues. No knowledge of appropriate use and dosing of key code medications (Fluid, Epinephrine, Atropine, Versed, Fentanyl, Ativan, chemical paralysis).

- **Fair**: Delayed recognition of abnormal cardiopulmonary status/dysrhythmia. Significant delay or partial success in recognizing and implementing appropriate monitoring and treatment for the above issues. Partial knowledge of appropriate use and dosage of key code medications (Fluid, Epinephrine, Atropine, Versed, Fentanyl, Ativan, chemical paralysis).

- **Good**: Appropriate recognition of dysrhythmia/abnormal cardiopulmonary status. Slightly delayed but otherwise complete implementation of appropriate monitoring and treatment for the above issues. Appropriate knowledge of appropriate use and dosage of key code medications (Fluid, Epinephrine, Atropine, Versed, Fentanyl, Ativan, chemical paralysis).

- **Very Good**: Appropriate recognition of dysrhythmia/abnormal cardiopulmonary status with complete implementation of appropriate monitoring and treatment. Intuitive knowledge of appropriate use and dosage of key code medications (Fluid, Epinephrine, Atropine, Versed, Fentanyl, Ativan, chemical paralysis). Partial knowledge of usage of “second-line” drugs such as amiodarone, lidocaine, etc.

- **Excellent**: Appropriate recognition of dysrhythmia/abnormal cardiopulmonary status with complete implementation of appropriate monitoring and treatment.
“Rapid Cycle, Deliberate Practice”

- Debrief model described by Elizabeth Hunt MD, MPH, PhD (Johns Hopkins)
- Directed feedback given several times mid-scenario.
- Repeat simulation from the beginning with deliberate practice of new (good) behaviors.

1. Novice performance
2. Competent performance
3. Proficient performance

Feedback, repeat
Feedback, repeat
Feedback, repeat
Methods: Program evaluation

• Pre-and post-activity surveys (4 point likert scale) used to evaluate the program.
• Medical management
  – Identification of a deteriorating patient.
  – When and how to call for help
  – What equipment and medications to prepare prior to code team arrival
• Non-technical skills/ CRM
  – Role and patient care responsibilities during an emergency
  – Importance of identifying a single code team leader
  – Importance of closed-loop communication
  – Comfort level in speaking up during emergent situations
Results

- 455 learner encounters in 1 year
- 42 sessions
Gap Analysis Summary

Program evaluation:

"I know what medications and equipment to prepare for a deteriorating patient prior to arrival of the code team"

![Bar chart showing the percentage of agreement for the statement.](chart)

- **Strongly disagree**: PreSTART and PostSTART have very low percentages, indicating a strong disagreement.
- **Somewhat disagree**: PreSTART has a higher percentage than PostSTART, showing a trend towards agreement.
- **Somewhat agree**: PostSTART has a higher percentage than PreSTART, indicating a shift towards agreement.
- **Strongly agree**: PostSTART has a significantly higher percentage than PreSTART, showing a strong shift towards agreement.

*p < 0.01*
Program evaluation:

"I know my role and patient care responsibilities during an emergent situation"

- Strongly disagree
- Somewhat disagree
- Somewhat agree
- Strongly agree

PreSTART vs. PostSTART:

- p < 0.01
Program evaluation:

"I understand the importance of a single team leader"

% 100 90 80 70 60 50 40 30 20 10 0

Strongly disagree Somewhat disagree Somewhat agree Strongly agree

PreSTART PostSTART

p < 0.01
Program evaluation:

"I feel more comfortable speaking up during emergent situations"

![Bar chart showing percentage of responses to the statement. Pre- and post-start comparison, with p < 0.01 for the difference.](chart.png)
Conclusions

1. An in-situ, simulation-based, interdisciplinary educational program can be successfully implemented and sustained in a busy pediatric tertiary care hospital.

2. Previously unrecognized weaknesses (and strengths) in inter-professional collaborative competencies can be revealed with the help of a gap analysis.

3. Simulated pediatric emergencies can provide concrete experiences for developing collaborative practice and improving resuscitation skills.