Discussion of Acute Care Competence

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1. Medical simulation is defined as “a person, device, or set of conditions which attempts to present [education and] evaluation problems authentically. The student or trainee is required to respond to the problems as he or she would under natural circumstances.”

2. Aim of physical therapy education is to ensure students attain the skills, knowledge, attitudes, and behaviors to enable solid clinical decision making, resulting in safe, effective practice in all settings.

3. The ICU is a challenging environment and complications of critical illness such as intensive care unit such as (ICU)-acquired weakness, neuropsychiatric abnormalities, impaired functional mobility, and decreased quality of life may be ameliorated by early rehabilitation.

4. A recent self-report survey of ICU based physical therapists revealed challenges and barriers to providing early rehabilitation:
   a. Greater than 25% of physical therapists working in the ICU perceive that inadequate training is a significant barrier to working in the critical care setting.
      i. ICU-training methods for physical therapists are primarily “informal” relying on mentorship and departmental based competencies.
   b. PT consultation & treatment frequency influenced by “inferred” patient complexity.
      i. Bed level exercises routinely performed but higher intensity, progressive mobilization is negatively impacted by perceived patient complexity.
      ii. The more invasive the line/tube, the increased frequency of bed level activity ONLY; minimal out of bed transfers, standing or walking.

5. How do results from a self-report survey compare to observed physical therapists practice regarding the performance of “early rehabilitation” in the ICU?
   a. Australia/New Zealand & Germany 1- day point prevalence data from:
      i. Adult patients who require mechanical ventilation are rarely mobilized out of bed. The likelihood of being mobilized out of bed was still lower if the patient had an endotracheal tube.
   b. Canadian survey noted that passive range of motion was the most frequently applied intervention and gait training was infrequently performed with critically ill children.

6. Competence is the application of knowledge, skills, and behaviors required to function effectively, safely, ethically, and legally within the context of the individual’s role and environment.

7. Simulation may be an effective educational method to prepare students to become competent physical therapy practitioners in the acute care and critical care environments. Simulation experiences can be designed to include:
   a. Knowledge, skills and behaviors reflective of acute care practice that have been identified through a nationwide practice analysis
   b. Themes that form the core of the clinical reasoning process in the acute care setting: (1) collection and analysis of medical information, (2) application of specialized physical therapy knowledge, (3) communication to gain information, and (4) communication to provide information. These themes were identified through semi-structured interviews of practicing acute care physical therapists.
References:
Evidence-based Best Practice Instructional Design Features of Immersive Simulation  

Patricia J Ohtake, PT, PhD

Implementation of Simulation-based Health Professional Education

1. Professional Integrity of Participants
   • It is essential to maintain confidentially about the scenario and the actions of the participants who were involved in the experience. Learners who discuss the scenario and the actions of the learners in their group risk negatively impacting the simulation experience. Simulation should be a safe place to learn.

2. Objectives the Simulation Experience
   • The simulation experience allows learners to develop technical and non-technical skills based on knowledge they have previously gained through other methods of instruction.
   • Learning objectives of the simulation experience should be clearly identified. The simulation experience is developed to meet the identified learning objectives.

3. Simulation Center Orientation
   • Providing learners with an orientation to the behavioral expectations of the simulation center, the equipment, and the mannequin (if using) allows for seamless engagement in the experience. Orientation can be done just prior to the simulation experience or at another time prior to the simulation experience.

4. Facilitator/Debriefer
   • The facilitator/debriefer explains the purpose of the simulation experience to the learners, guides them through the simulation experience, and leads the debriefing. Facilitator/debriefers require excellent communication and teaching skills.

5. Debriefing
   • Debriefing (feedback immediately following the simulation experience) is essential for learning. The simulation experience sets the stage for the learning and the debriefing period allows learners to process and learn from the experience. The debriefing method of Advocacy-Inquiry has been shown to promote deeper learning than other methods of debriefing.

6. Learner Assessment
   • Simulation experiences can be high stakes (assessed) or low stakes (experiential), depending on the objectives of the experience.

Evidence-based Best Practice Instructional Design Features of Simulation

1. Feedback
   • This is thought to be the most important feature of simulation. Debriefers are encouraged to promote self-reflection and discussion among the learners as opposed to “teaching”. Video-assisted debriefing is useful to promote reflection and discussion.

2. Deliberate practice
   • Deliberate practice consists of learners engaging in an appropriately difficult task that requires focused, repetitive practice with feedback to reach a level of mastery.

3. Curriculum Integration
   • Ideally, the simulation experience should be thoughtfully integrated with other academic (lectures and patient cases discussions, for example) and clinical learning experiences.

4. Outcome Measurement
   • Learner outcomes should be measured. Several methods include 1) observation by an experienced healthcare professional, 2) assessment of the learner through surveys,
knowledge tests, or activities such as writing a patient note, and 3) haptic sensors that record “touch” (these are useful for technical skill development, i.e. arthroscopy)

5. Simulation Fidelity
   - Ideally, the simulation experience should be as realistic as possible to provide a convincing learning environment.

6. Mastery Learning
   - All learners accomplish all educational objectives with little or no variation. A minimum passing score is usually set to identify when mastery has been achieved.

**Instructional Design Features Associated with Specific Outcomes**

**Outcome #1: Patient Satisfaction**

Instructional Design Features
- Group practice – 2 or more learners
- Repetitive practice – being able to have more than one try at the experience
- Using multiple learning strategies – patient cases, discussion, feedback, task variation

**Outcome #2: Learner Knowledge**

- Using multiple learning strategies – patient cases, discussion, feedback, task variation

**Outcome #3 – Time to Complete the Task**

- Distributed practice – training over a period of time, not all at once

**Outcome #4 – Non-Timed Successful Completion of the Task**

- Cognitive interactivity – training that promotes the learner’s cognitive engagement including multiple repetitions, feedback, task variation
- Distributed practice – training over a period of time, not all at once
- Feedback – quality debriefing
- Individualization – training being responsive to the learner’s needs
- Using multiple learning strategies – patient cases, discussion, feedback, task variation
- Range of difficulty

**Outcome #5 – Behavior and Patient Effects (communication and errors)**

- Using multiple learning strategies – patient cases, discussion, feedback, task variation

Evolution of Acute Care Simulation at University of Colorado, Anschutz Medical Campus
Wendy Kriekels, PT, DPT, NCS and Amy Nordon-Craft, PT, DSc

Background
Physical therapy presence in critical care and ICU
One lecture and one lab with sub-optimal space, shared equipment
Minimal emphasis on preparing the students ahead of time

1. Phase One 2007 – 2009
A. Phase One Learning Objectives
   • Identify lines, tubes, and medications typically found in the ICU and describe the precautions of these.
   • Demonstrate effective mobilization of the mock patient in ICU, incorporating knowledge of normal and abnormal vital signs.
   • Write one applicable physical therapy goal for a case to turn in at the end of the lab session.

B. Description of experience
   • Low Fidelity Simulation with students as patients
   • Complex scenarios
   • Multiple Lines/Tubes
   • Hospital Beds
   • Groups of 4-5 students

C. Lessons Learned
   • Too much new information introduced
   • Technical Skill practice
   • Assistance and feedback from instructors
   • Some realistic issues and gained sensitivity to treating in the ICU
   • Practice writing a goal

2. Phase Two 2010 – 2012
   • Accessibility of high fidelity mannequin simulation
   • Center for Advancing Professional Excellence (CAPE)
   • Additional Considerations
     o Does mannequin simulation augment our learning outcomes?
     o What are the additional financial costs?
     o Are there additional faculty resources?
     o What are the additional scheduling considerations?

A. The Learner Centered Team Coaching Process
   • Balance of relationship building and structure
   • Relationship centered communication
     o Open ended questions
     o Positive non-verbal language
     o Reflective listening
     o Empathy for patient and each other
B. Simulation Experience
   • Brief
     o Review rooms and flow (CAPE faculty)
     o Review of objectives (DPT faculty)
   • Simulation Experience
     o Chart review and lines/tubes ID
     o Initial Examination and mobility
     o Report out
   • Debrief
     o Acknowledge team’s experience and feelings
     o Identify desired outcomes for team and patient
   • Student survey following the experience

C. Learning Objective Evolution
   • High Fidelity Simulation Objectives
     o Assess the patient’s clinical status and readiness for PT intervention
     o Assess and respond appropriately to the patient’s physiologic changes during mobilization
     o Safely mobilize the patient to sitting on the edge of the bed while observing all precautions associated with various lines, leads, and tubes
     o Suggest additional interventions that may be beneficial
   • Low Fidelity Simulation Objectives
     o Identify lines, tubes, and medications typically found in the ICU and describe the precautions of these.
     o Demonstrate effective mobilization of the mock patient in ICU, incorporating knowledge of normal and abnormal vital signs.
     o Write one applicable physical therapy goal for a case to turn in at the end of the lab session.

D. Lessons Learned
   • High Fidelity Simulation lab emphasis
     o Vital sign monitoring
     o Medical stability of patient
     o Teamwork and articulating general plan
     o Examination
     o Clinical reasoning
   • Low Fidelity Simulation lab emphasis
     o Actual moving of realistic patients
     o Safety, guarding, monitoring of patient communication and movement
     o Written goal improved with students getting to “see an actual portrayal”
     o Intervention
     o Technical and behavioral skill
3. **Phase III  2012 – 2014**

   **A. Acute Care Lab session**
   - Priority to prepare students for a hospital clinical experience
   - First year students
   - Focus on safe mobilization
   - Faculty portraying patients
   - Removed the emphasis on lines/tubes, ICU

   **B. CAPE High Fidelity Mannequin Simulation**
   - Second year students
   - Emphasis on lines/tubes
   - Integration of mechanical ventilation
   - Student response to patient change
   - ICU room much more realistic

   **C. Student Assessments**
   - Student Surveys
     - Zoommerang
     - Satisfaction with Simulation Experience Scale
       - Debriefing and Reflection
       - Clinical Reasoning
       - Clinical Learning
   - Anecdotal feedback from clinical instructors

4. **Future directions**

**References:**


