SPA Simulation Workshop: Designing Your Own Scenario
Course Syllabus

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1. Workshop Goals and Objectives:
   Goals:
   Introduce the key elements in patient simulation scenario design and see developed scenarios played out to develop an improved understanding of how to create effective and realistic scenarios. Also, develop an understanding of what is necessary to run a simulation scenario, including personnel, equipment, materials, and space.

   Objectives:
   1. Review key elements in scenario design
   2. Develop individual scenarios in small workgroups
   3. Enact and debrief two of the developed scenarios
   4. Understand positive and negative elements in developed scenario
   5. Understand the resources required to run the scenario

2. Content and Timeline:

   13:30 – Intro and Elements of Scenario Design
   14:00 – Create Scenarios
   14:45 – First Scenario Set Up
   15:00 – Run First Scenario
   15:20 – Debrief First Scenario and Feedback
   15:35 – Second Scenario Set up
   15:45 – Run Second Scenario
   16:05 – Debrief Second Scenario and Feedback
   16:20 – Wrap Up, Discussion
   - What worked? What didn't work? What might have been changed?
   - What are some of the limitations presented by the equipment, space, etc.?
   - Any changes to other planned scenarios based on lessons learned from practice session with other groups?
3. **Key Points in Developing a Scenario:**
   
   **A. Define Purpose of Simulation Scenario: What will be accomplished?**
   - fill educational gap
   - learn or assess new skills/techniques/performance
   - look at workflow/process/organizational issues
   - replace past training methodologies
   - practice – new teams coming together

   **B. Primary Issues to consider: 5 W’s**
   - Who: trainee, faculty, nurses, whole team?
   - What: sick patient/environment/equipment/personnel/ethics
   - Where: sim center/in-situ/virtual world/other
   - When: part of course/announced/unannounced/augment rounds
   - Why: learn review errors, processes/pre-view events/new team training

   **C. Scenario Development:**
   - creating realism
   - cases from “archives”

   **D. A Basic Course Overview:**
   - pre-briefing: concepts, diagnoses, teamwork, etc.
   - rules: how to work in environment, limitations
   - simulation exercise
   - debriefing: critical to reinforce concepts, analyze performance

   **E. Creating A Storyboard:**
   - a series of depictions of progression of events
   - clearly defines the message desired
   - includes credible props/equipment to ensure realism

   **F. Good Crisis Scenario:**
   - plausible – based in realistic physiology/pathology
   - just one or two abnormalities to focus on
   - time pressure – develops realistic chaos
   - several streams of data at once, requires cross-checking
   - multiple possible solutions, differential diagnoses or treatments
   - require team coordination and cooperation for effective management

   **G. Good Cases:**
   - issues with changing “best” management
   - rare cases with serious possible outcomes
   - a vulnerable area in your own institution; an “Achilles heel”
   - requires various team configurations/players: RT, Pharm, Etc.

   **H. Bad Cases:**
   - relies heavily on equipment or obscure physical findings
   - relies heavily on external resources and personnel
   - forces people into unfamiliar roles or tasks
   - secondary to environmental/simulator failure
I. Plan Ahead:
- Simulator Team: must have a shared mental model
- Check Sheets: equipment/supplies/steps/VS’s
- Pre-event huddle
- Golden Rule – simple is better

J. Running the Scenario:
- set the rules of engagement: orient participants, encourage use of cognitive aids (not a test, an attempt at reproducing real life), ensure confidentiality for participants

4. Background:

a. Review of ACRM Principles:
Anesthesia Crisis Resource Management (ACRM) refers to a system of appropriate team and individual responses to a crisis in a patient under anesthesia. This system is based on principles and techniques derived in Aviation: Crew Resource Management. Training in these techniques teaches crews to work together through a crisis in a simulated environment, and was developed as a method to reduce the system and communication errors inherent in the complex world of aviation. The primary goal of crisis management is to detect a problem early in its evolution, then mobilize an appropriate response in order to prevent an adverse outcome.

Many of the keys to ACRM revolve around maintenance of situation awareness and effective dynamic decision-making. Leadership ability and communication among team members is essential, as is the effective use of all available resources. The table below lists the behaviors that are associated with an improved team response to crisis as taught in ACRM.

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<tr>
<th>Primary Responses</th>
<th>Anticipate and Plan: prepare the environment</th>
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<tr>
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<td>Call for Help Early: maintain situation awareness</td>
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<td>Take command as team leader</td>
<td>Who is in charge: make it clear to Team</td>
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<td>Prioritize tasks</td>
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<td>Assign Tasks</td>
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<td>Be respectfully assertive</td>
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<td>Communicate effectively</td>
<td>State requests/commands clearly and succinctly</td>
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<td>Identify individuals when speaking</td>
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<td>Close the communication loop</td>
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<td>Encourage open and equal exchange of information</td>
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<td>Avoid blame and conflict: <strong>what</strong>; not <strong>who</strong></td>
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<td>Distribute the workload</td>
<td>Assign tasks to appropriately skilled individuals</td>
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<td>Team leader delegates tasks unless no other can do so: then must assign leadership while involved in completing task</td>
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<td>Scan for failures role completion, overload in task</td>
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**Allocation of attention**
Maintain vigilance with delegation of tasks to properly allow an optimal patient outcome
Assign someone to monitor patient and time

**Use all available resources**
All Team members
Backup personnel: code team, ICU staff, etc.
Equipment: know where emergency equipment is kept and ensure maintained well
Cognitive Aids: protocols, algorithms

### b. High-Fidelity Simulation: High-tech Mannequins and Patient Actors

There are many types of simulation, requiring a wide range of facilities and equipment to perform, but all types can be succinctly elucidated as creation of an artificial environment that replicates a real-world situation to achieve a particular objective. High-fidelity simulation refers to simulation scenarios that closely replicate the true environment, making it easier for participants to believe in the reality of the situation depicted, and thus to apply realistic responses.

Adult learning is facilitated using performance learning, where active participation replaces passive assimilation of information. Evocation of emotional responses improves the learning process and increases retention as well. High-fidelity simulation creates just such a learning environment. A scenario is created to replicate a realistic clinical situation; this is then simulated for learners using faculty facilitators. Each participant is given a role to play during the scenario: the learner might be in the role of the anesthesiologist, the circulating nurse, or the GI endoscopist. Faculty facilitators will take other roles in the team, playing the parts as the scenario unfolds to help present the appropriate cues for the learner. This is then followed by a debriefing session, key to understanding the way in which the learner and team interacted during the crisis using reflective analysis, and in creating formative feedback to the learner. (see section 5 below).

High-tech mannequins have been developed by several companies for use in simulation. These mannequins are made to represent patients of varying ages, from neonates to adults, and come equipped with mechanical and electrical parts to produce various effects, from respiration, coughing, and vocalization, to hypotension, cyanosis, and wheezing. Heart tones, chest wall motion, palpable pulses, and closure of the airway can all be mimicked, and interactions are possible including bag-mask ventilation, intubation, IV start, and in some cases chest tube insertion or crico-thyrotomy. A monitor connected to these mannequins can be manipulated by a technician to replicate the patient responses to interventions and to create a picture of the pathophysiology being depicted in the simulation. Some simulation systems include software that has been created to provide automatic realistic responses to interventions, including chest compressions, ventilation, and administered drugs.
When Communication skills were made one of the Core Competencies for Graduate Education, the central importance of clear and effective communication in medicine was emphasized. Team communication is very important and can be practiced during simulated scenarios involving mannequins, but effective communication with a patient or family member cannot be simulated well with these tools. Thus, standardized patient actors are frequently being used in many simulated situations in both Medical Schools and other educational venues. Using patient actors allows learners to interact with a "patient" or "family member" capable of evoking convincing emotions and able to improvise and adjust responses based on the learner's input. This type of high-fidelity simulation can also create complex and subtle interactions, with the ability to practice the most basic features of medicine: effective history taking and counseling, or to develop a caring and empathetic approach. Videotaping of the interactions for review during debriefing, also helps the learner see how they come across and the non-verbal communication cues they may be using unknowingly.

**c. Debriefing: Utility and Techniques:**
Debriefing is a session created to bring participants in a crisis or an event together and review what occurred. The goals of a debriefing session may vary, but in ACRM, the technique is used to allow members of the team a chance to review their performance, to understand the drivers in the crisis, to understand how they were able to manage the crisis as a team, and to learn some general principles in crisis management that they may then use more effectively during future critical events.

Facilitated debriefing is the key to learning from a simulation scenario. During a critical event, attention is intensely focused on managing the crisis and completing necessary tasks. It is only in the later analysis, that an understanding of all the factors impacting on the outcome can be evaluated. This then leads to learning from the event, its management, and any failures that occurred. A facilitator is important in guiding the debriefing and framing the learning points.

Ideally, the facilitator will lead the participants in the crisis through the event and elicit their own reactions to occurrences, assisting them in developing their own analyses. Material covered in a group discussion is much more likely to be retained than that passively obtained in a lecture type presentation. In addition, when participants provide their own insights and observations, they feel their input has been heard and then have more of a stake in the discussion and a sense that their ideas become part of the conclusion. These conclusions then become more acceptable and believable to the participants.

Facilitating a debriefing well takes time and practice: here are some of the major points to consider when working in this role:

**Things to do:**
- Set expectations for crew participation
- Engage the team to facilitate achieving those expectations
- Cover all critical topics
- Balance the discussion: draw in quiet participants
Cover teaching points to be made – integrate into discussion at appropriate times
-Discuss positive actions and how they impacted outcome

Things to avoid:
-Don’t Lecture
-Don’t provide your own analysis before it is “discovered” by team’s analysis
-Don’t give impression that your observations are the most important
-Limit interruptions of team discussion
-Don’t create the sense of an interrogation
-Avoid a rigid agenda
-Don’t cut sessions short when outcomes are positive

Debriefing sessions are most effective when the team members are able to guide their own discussion based on observations of their own, using the facilitator to initiate the discussion by setting the objectives and assist in leading the discussion minimally. Teams that have not previously participated in this type of analysis or group discussion will require much more guidance on the part of the facilitator.

Starting with an introduction, that outlines the expectations for the session and the ways in which the team members will participate, is essential. Setting a format will then help the team develop an agenda for the session. The facilitator should be sure that all critical items are included in the agenda. The basic principles of ACRM should be used to frame the analysis and evaluation. Finally, the lessons learned from the session should be explicitly reviewed and generalized if possible.

Some of the techniques that encourage active team member participation and in depth analysis of events are the following:
-Ask Questions: What, Why, How
-Engage all team members in the discussion
-Re-word questions instead of answering – allow the crew to answer the questions
-Allow pauses and silence to encourage thoughtful analysis and time for answers

In summary, debriefing creates the opportunity for members of a team involved in a crisis situation to reflect on their performance, review the elements that were active during the crisis, analyze how these factors impacted the outcome, and develop some lessons to be carried away and used in future situations. In addition, basic concepts useful in approaching any crisis can be emphasized during the debriefing, allowing a review of important skills that can then enhance participants’ performance in a wider set of circumstances.
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