

# Simulation-Based Training

## *The Future of Competency?*

Julie M. R. Arafeh, MSN, RN

### ABSTRACT

Traditionally, continuing education has focused on cognitive skills and technical skills, namely, what the provider needs to know and what the provider needs to be able to do. Successful completion of such education programs has conferred some degree of competence on the learner. For the most part, continuing education has been performed in silos with each healthcare provider discipline developing a program designed to meet the needs of their group. The Institute of Medicine and the Joint Commission have issued reports addressing patient safety, morbidity, and mortality of the newborn infant and maternal mortality, respectively. These reports call for the education of healthcare providers to include multidisciplinary team training and/or drills. Simulation-based training (SBT) is a methodology of education that is uniquely able to address cognitive and technical skills as well as behavioral skills and is ideal for multidisciplinary team training. As a result, SBT is beginning to be adopted in healthcare education. However, the following questions remain: Is a dedicated simulation space necessary, how should SBT be incorporated into the existing education program, and will it confer competency?

**Key Words:** competence, healthcare education, healthcare, simulation, simulation-based training, training

**C**ontinuing education is a requirement for every discipline of healthcare provider. Traditionally, continuing education has focused on cognitive skills, namely, what the provider needs to know and

technical skills or what the provider needs to be able to do. Successful completion of such education programs has conferred some degree of competence on the learner. For the most part continuing education has been performed in silos with each healthcare discipline developing a program designed to meet the needs of their group. Recently, bodies such as the Joint Commission and the Institute of Medicine (IOM) have called for a change in healthcare education to include multidisciplinary team training and improvements in behavioral skills such as communication.

In 2000, the IOM released a ground-breaking report on the status of healthcare in the United States estimating that as many as 98,000 patients per year were victims of errors.<sup>1</sup> Communication failures were listed as one of the errors contributing to the finding. In 2004, and again in 2010, the Joint Commission issued sentinel event alerts addressing morbidity and mortality of the newborn infant and maternal mortality, respectively.<sup>2,3</sup> Both alerts call for the education of healthcare providers to include interdisciplinary team training and/or drills. Simulation-based training (SBT) is a methodology of education that is uniquely able to address cognitive and technical skills as well as behavioral skills and is ideal for team training.<sup>4,5</sup> As a result, SBT is beginning to be adopted in healthcare education. However, the following questions remain: Is a dedicated simulation space necessary, how should SBT be incorporated into the existing education program, and will it confer competency?

**Author Affiliation:** Obstetric Simulation Specialist, Center for Advanced Pediatric and Perinatal Education, Stanford University School of Medicine, Palo Alto, California.

**Corresponding Author:** Julie M. R. Arafeh, MSN, RN, Obstetric Simulation Specialist, Center for Advanced Pediatric and Perinatal Education, Stanford University School of Medicine, 700 Welch Rd Ste 200, Palo Alto, CA 94304 (jarafeh@stanford.edu).

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### SIMULATION-BASED TRAINING

Including simulation as part of continuing education allows the learner to utilize their skills in a hands-on, interactive manner. Simulation-based training places learners in an environment with realistic cues and time pressure that closely resembles actual patient care. In this setting, the team responds to a patient situation or

scenario that is based on learning objectives. For example, in the case of a shoulder dystocia, learning objectives may include performance of maneuvers to relieve the dystocia, coordination of the team and the patient to work together to accomplish birth and calling for help appropriately. After the scenario, the team has the opportunity to review and discuss their performance in the debriefing.<sup>4,6</sup>

## TEAM TRAINING

Rarely does one discipline of healthcare provider manage patient care alone particularly in an emergency. Composing teams of learners from disciplines that would work together in the actual patient setting adds realism to the educational program.<sup>5</sup> Through SBT, different disciplines have time to discuss issues such as workload distribution and patient management priorities.<sup>6</sup> This opportunity is limited in the actual, real time patient setting.

The actual site of patient care is an ideal location for this type of training. Some SBT programs will have access to a room or center devoted to simulation as an alternative training site. Regardless of where SBT occurs, the basic concepts of developing scenarios based on learning objectives with realistic cues and debriefing following each scenario is included. As challenges exist in either location, simulation instructors and administration will need to determine the best location for training in their unique setting.

In SBT, each patient care scenario is based on cognitive, technical, and behavioral learning objectives. Key behavioral skills were identified by psychologists at the National Aeronautics and Space Administration that support team performance as noted in the Table 1.<sup>7</sup> Inclusion of behavioral learning objectives allows healthcare providers the opportunity to practice skills that enhance team communication and organization of care. Incorporation of these skills into practice can ultimately lead to improved function of the team.<sup>4,5</sup> Because a interdisciplinary team is involved in the scenario, learning objectives will need to be written that satisfy learning

requirements of the entire team and as well as be discipline specific. For example, support of breathing may mean effective bag mask ventilation for respiratory therapy and nursing staff but may also include placement of an advanced airway for medical staff.

A key component of SBT is the debriefing that follows each scenario.<sup>6</sup> During debriefing, the team has the opportunity to reflect upon and discuss the events of the scenario. Capturing the scenario on videotape allows the team to view the events objectively particularly those that relate to behavioral skills. Inclusion of simulation instructors from all disciplines represented in the training session ensures that learning objectives are relevant for all and that content experts are present from each discipline during debriefing.

## ROLE OF THE EDUCATOR IN SBT

In SBT, the role of the educator/instructor changes dramatically from that of a more traditional educator role. When giving a lecture, the instructor is in control of the educational process until the learners interact with questions they have on the topic being discussed. However, in SBT, once the scenario begins, the learners guide the scenario progression on the basis of how they respond to the situation presented to them for management. At the end of the scenario during debriefing, instructors facilitate team discussion instead of lecturing on the content in the learning objectives. During the debrief, it is the job of the instructors to ask questions that allow the team to discuss why they chose a particular course of action and what other strategies are available in this situation. Most importantly, the learners look at the performance of the team to determine what supported effective performance and what detracted from it. Ideally, the team has the opportunity to then go back into the simulator to experience a different scenario where they can use the skills that enhanced team performance and change those that detracted from efficiency.<sup>8</sup>

Placing the team in a situation where errors will be detected and reviewed on video is a huge departure from the current climate in healthcare, where the response to errors is often punitive in nature. In the past, healthcare education has been documented on the basis of passage of a test or completion of a skill based on a series of required steps. In this type of evaluative process, mistakes are not the desired outcome. These types of evaluation are still valuable and appropriate but not for a methodology such as SBT. SBT is a forum where mistakes can be made, new skills adopted in a realistic training environment, and systems errors may be uncovered.<sup>6</sup>

To participate in scenarios and debriefings where the goal is to reveal gaps in performance, safeguards

**Table 1. Behavioral learning objectives**

1. Know your environment
2. Anticipate and plan
3. Assume the leadership role
4. Communicate effectively
5. Distribute workload optimally
6. Allocate attention wisely
7. Utilize available information
8. Utilize available resources
9. Call for help
10. Maintain professional behavior

need to be in place to support the learner. Safeguards include absolute confidentiality about the performance of the learner, the team and the specifics of the scenario. Before the scenario, learners and instructors review the parameters of confidentiality and sign a form outlining these parameters thus confirming willingness to abide by them. No discussion about performance or scenario specifics is to occur outside of the debriefing area nor will the performance in the scenario be used in any way in annual evaluation of the individual learner.<sup>6</sup>

Another key safeguard for the individual rests with the instructors. Facilitating the debriefing requires that the instructor guides discussion to be complete in review but constructive in nature. This can be accomplished by acknowledging what occurred during the scenario in terms of standards of care instead of individual performance.<sup>6</sup> For example, if the learning objective is to follow the Neonatal Resuscitation Program algorithm, debriefing should focus on whether the *team* met this objective. Any gaps in performance should be discussed in relation to the algorithm and what strategies can be used in the future to ensure the algorithm is followed. Because team and system errors will likely be uncovered, the SBT program will benefit from collaboration with the Quality Assurance/Improvement Department to protect performances and findings from being used in a malpractice suit in the legal arena.

## COMPETENCY VALIDATION

If specifics of the performance will not be used in an evaluative manner, then can SBT be used as competency validation? The debate on how to define and measure competency is beyond this discussion, but looking to standards adopted by regulating groups can be helpful. The Accreditation Council for Continuing Medical Education uses the definition of competence found in Miller's review of assessment of clinical skills, competence, and performance.<sup>9</sup> Miller defines competence as having knowledge with a strategy to utilize that knowledge.<sup>10</sup> Using this definition, SBT can meet the requirement for competency. Once the topic of a scenario is determined and learning objectives are created, information about that topic can be sent to the team who will participate in training. Information may be in the form of reading material, computer-based learning, or content review followed by a test in which the individual must get a certain percentage to attend the training. During SBT, content knowledge and strategies for use can be discussed by the team and instructors thereby conferring competence as earlier defined.

Measurement of competence in this fashion still does not meet the difficult task of determining whether an individual or a team will perform in an acceptable way

when providing patient care. This continues to be an elusive measurement in healthcare. Perhaps the closest proximity can be found in the data generated by quality improvement or assurance programs. In most patient care areas, these programs are charged with collecting data on patient outcomes, analyzing that data to detect trends and reviewing isolated undesirable outcomes such as sentinel events.

Quality assurance/improvement programs and SBT can mutually support and benefit from each other. Information from quality or risk management programs about problematic trends in patient outcomes can be utilized in several ways in SBT. The data can provide direction for the topics that need to be covered in scenarios. Learners will need to be aware that the content of the scenarios and learning objectives are derived from outcome data to reinforce the importance of the content and participation in training. Creating measurable learning objectives that highlight problems detected in outcome data or sentinel event review may result in discovering a solution to the issue. For example, a sentinel event review found that delay in obtaining a sufficient amount of blood components in response to a maternal hemorrhage was thought to be a factor in severe maternal morbidity. During in-house drills on maternal hemorrhage, measuring the length of time for delivery of blood and the amount of blood components brought to the Labor and Delivery unit spurred discussion between the blood bank and representatives from the unit. These discussions led to refining and streamlining the process the unit used to obtain blood components. Embedding these types of measurements into SBT allows the instructors to collect data in addition to more traditional evaluation of training such as learner satisfaction. Data specific to unit issues can help to guide and support change.

Collecting data can be an overwhelming task. Utilizing the information from data collection that is ongoing, such as that collected by other hospital departments, reduces the workload for simulation instructors when evaluating training. Furthermore, close alignment with other departments adds to the importance of SBT to the overall performance goals of the hospital.

## SUMMARY

Simulation-based training is an educational methodology that can uniquely address cognitive, technical, and behavioral learning objectives for a healthcare team. By carefully defining competency, simulation instructors can use SBT to determine competence of a team without violating confidentiality safeguards needed for learners to safely participate in this type of training. Collaboration with departments that are charged with

the task of patient outcome data collection and sentinel event reviews can strengthen and align both the department and SBT.

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