CHAPTER 17

Simulation: The Low-Tech, Low-Cost Version

The use of simulation in healthcare appears to be growing as more organizations embrace the approach to developing effective care procedures. Many institutions have built large simulation labs and equipped them with high-fidelity simulators and technology. While this infrastructure is helpful to any organization seeking to improve safety in care delivery, this chapter emphasizes how a hospital or health system of any size or margin can implement simulation without dedicating the lab space and purchasing the expensive equipment. Some simple steps can support an organization in building a low-fidelity, in situ simulation program.

SIMULATION IN HEALTHCARE

The Joint Commission considers high reliability in healthcare to reflect consistent excellence in quality and safety for every patient, every time (Loeb and Chassin 2013).

Why Simulation?

How does simulation support a high-reliability environment? Examples of the ways simulation can be used are presented according to
Weick and Sutcliffe’s (2015) high-reliability principles, introduced in part I of this book: preoccupation with failure, reluctance to simplify, sensitivity to operations, commitment to resilience, and deference to expertise.

Simulation can be used in the context of the preoccupation with failure to build virtually fail-safe processes or procedures. Running simulations—experimenting with or testing and then measuring the outcomes of procedures—can identify weaknesses in the system prior to implementation.

Where sensitivity to operations and situational awareness (as discussed in chapter 15) are concerned, the organization can use simulation to identify issues that may occur with current inpatients, providing a real-time benefit to those patients.

Debriefing techniques can be considered a type of simulation in terms of commitment to resilience, whereby the organization conducts huddles following a difficult case or an environmental emergency. Staff are provided with opportunities for follow-up and resources, such as access to targeted employee assistance programs and critical incident stress management assistance. Debriefing also enables leadership to identify staff who may be at risk for burnout and provide a proper level of support.

Finally, in alignment with the principle of deference to expertise, once simulations have been run, feedback is gathered from the people who participated—those who do the work—about how to address system issues that have been identified.

Emerging research also supports the use of simulation in health-care. Task training for competency and team building are two main areas of focus. In their article “The Top Patient Safety Strategies That Can Be Encouraged for Adoption Now” (Shekelle et al. 2013), the authors describe those patient safety interventions that are highly encouraged or encouraged on the basis of findings in the current literature. Those interventions that are highly encouraged include adopting bundles for addressing hospital-acquired conditions and using stringent hand-hygiene protocols. Use of simulation is an intervention that falls under the “encouraged” category.

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History of Simulation in Healthcare

The history of simulation in healthcare can be considered in three main eras. First is the use of the so-called actual patient simulator. People might recall such a model from their initial CPR course using the mannequin Resusci-Annie. These courses were designed in the 1950s. Next, in the 1970s, simulation training was introduced for anesthesia residents and fellows. Then, in the 1990s, significant changes in medical education and a decrease in work-hour requirements led to the use of simulation to provide student physicians an adequate amount of clinical practice.

Now, a fourth era of simulation in healthcare is emerging as current patient safety efforts are driving its increased use in building teamwork and communication skills. The academic environment continues to create interprofessional simulation scenarios to enable physician, nursing, pharmacy, and respiratory care students to perform procedures as a team before they come together professionally following graduation.

SIMULATION FIDELITY

Simulation can be described in terms of a variety of types and levels of fidelity, or the degree of realism that can be produced during the simulation. In high-fidelity simulation, numerous components are joined to deliver the simulation experience. They may include task trainers for testing procedural competence; computer-based systems; gaming systems; actors posing as patients; and high-technology simulators modeled on humans that breathe, talk, and mimic other realistic elements. An example of high-fidelity simulation is the use of the entire care team and the equipment involved in cannulation for extracorporeal oxygenation, commonly known as heart–lung bypass.

Low-fidelity simulation may be seen as synonymous with low-tech, low-cost simulation. As described throughout the remainder
of the chapter, it can be as simple as a tabletop walk-through of a scenario.

**ORGANIZATION-WIDE SIMULATION ADOPTION**

Healthcare continues to rely on traditional education and communication methods to disseminate new knowledge and its application. But policies, care pathways, and many other healthcare-related processes are increasingly lengthy and complex. Webinars, PowerPoint presentations, e-mails, and communication boards are not always adequate to build competency, whereas simulation can build not only individual proficiency but also team-based abilities. Latent system issues can be uncovered, especially with in situ simulation.

In short, simulation can bring the organization to a new level of safety and improve patient outcomes. It can be used throughout the organization for a variety of applications. From general team-based training to working with high-risk, low-volume procedures to practicing a move to a new geographic location to testing new processes or procedures, many healthcare activities are increasing their use of simulation.

Some particularly nontraditional uses for simulation include building competency skills for compassionate conversations, training for leadership responsibility, and building reliability in patient care handoffs. These and other areas are ideal for simulation because they assist educators in identifying human factors issues such as fatigue, ergonomics, distraction, stress, and resource and knowledge deficits.

Simulation is also much better than classroom or online teaching is at addressing what Sidney Dekker (2011) calls cognitive fixation. Cognitive fixation describes the phenomenon in healthcare where caregivers have a mind-set of “this and nothing else.” In stressful situations, clinicians move along a decision-making path and may stay on that path even when symptoms emerge that should dictate different care decisions than those being made because of cognitive fixation. The other element of cognitive fixation is the thought that
“everything is alright.” Here, clinicians may believe that a patient is recovering in the face of threats to his or her well-being simply because one or two reassuring elements are present. Cases such as these are complex, and simulating them both proactively and following a real safety event can help build situational awareness. (Chapter 19 describes human factors in more detail.)

LOW-TECH, LOW-COST SIMULATION

To get started with a low-fidelity program of simulation, first, leaders should identify interested individuals who have had a positive simulation experience. Clinicians who have served in the military are often ideal candidates, as they are already well versed in the nature of simulation.

One approach to a low-tech simulation can proceed as follows: Find a unit nursing manager who is willing to try a just-in-time simulation on his or her unit. Then consider which patient scenarios could be developed into an interesting, teachable situation. Next, discuss with the manager what could potentially go wrong with that patient.

This straightforward process can be formalized as an exercise using the template in exhibit 17.1. The scenario template allows the leader to write up the scenario; designate the equipment that will be used; identify the supplies that will be needed; and provide an overview of the patient, including applicable patient vital signs and laboratory results. Other participants may be invited to join the simulation. As the simulation unfolds, changes to the patient’s status can be tracked on the basis of the interventions recommended by the clinicians.

A simulation can be broken down into three steps: brief, execute, and debrief. The goal of the briefing is to build psychological safety. Start with introductions and a brief explanation of the roles involved in the simulation process. Emphasize that the goals of the simulation are to build communication skills and teamwork and to
assist in the discovery of system issues. Encourage the participants to ask any questions they may have and to act as they would in a real-world care scenario using the equipment and resources available to them. Also emphasize that what happens in the simulation stays in the simulation; no one will be reporting back to managers on individuals’ performance.

Next, run the simulation. When you get to a logical finishing point, bring the team together to debrief. Steps for an effective debrief are as follows:

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1. Offer a piece of positive feedback.
   • “That seemed to go very well overall.”
2. Ask a participant to describe what occurred during the simulation.
   • “Can someone summarize the case?”
3. Engage the participants in an analysis of the simulation.
   • “What went well?”
   • “Where can we improve?”
4. Wrap up the simulation and thank the participants.
   • “Tell me one aspect of the simulation that you will take away from today’s exercise.”
   • “Thank you so much for participating. We know the experience can be uncomfortable, but this simulation will improve our patient outcomes.”

Allow all simulation attendees to participate at an equal level. Make sure to assign accountability for follow-up on any system issues identified. In addition, consider whether these issues could be occurring in another department in the organization. Safety behaviors such as communicating clearly, asking questions, and speaking up can be identified during a debrief. Debriefing allows organizations to close the gap between current practices and high-reliability practices.

The best way to begin is to start where you are. Engage the organization’s patient safety members to assist and give feedback; nursing and other department educators can also be helpful in this effort. Simulation does not have to be complex to be effective, and it can be a key process for hospitals and health systems concerned with becoming high-reliability organizations.