

## Simulation to Improve Patient Safety

### Situation

- The use of simulation in healthcare education has grown in recent years and has emerged as a key component of the patient safety movement; and is increasingly being used to improve clinical and teamwork skills in a variety of settings.<sup>1,2</sup>
- The Agency for Healthcare Research and Quality (AHRQ) published the Issue Brief, Simulation to Improve Patient Safety: Getting Started, in July 2024. The brief's purpose is to provide a basic roadmap of strategies to advance patient safety through simulation and debriefing; and to demonstrate the value simulation brings to patient safety improvement efforts.<sup>3</sup>
- The brief highlights these specific areas for the use of simulation:
  - to adopt and adapt best practices
  - to improve healthcare delivery systems
  - for the development of additional skills such as debriefings that improve clinical care, improving an organization's culture of safety and potentially provider well-being

## Simulation to Improve Patient Safety

### Background

- Simulation offers a way for learners to gain fluency in skills without risk to patients, and gain experience recognizing and responding to uncommon, high-risk, situations that might not otherwise occur over the course of their training.<sup>4</sup>
- When properly employed, simulation-based training allows the opportunity to learn new skills, engage in deliberate evidence-based practice, and receive focused and real-time feedback.<sup>4</sup>
- Simulation-based training enables the accelerated development of expertise, both in individuals and team skills, by bridging the gap between classroom training and real-world clinical experiences in a relatively risk-free environment.<sup>4</sup>
- Simulation in patient safety has shown reduction in adverse events after targeted simulation training, including medication errors.<sup>4</sup>

## Simulation to Improve Patient Safety

### Assessment

- ❑ Simulation can improve patient safety when used<sup>3</sup>:
  - to identify and mitigate latent safety threats.
  - as a test of change to implement quality improvement projects and reveal information during root cause analysis that would not otherwise have been discovered.
  
- ❑ Coupled with debriefing, simulation is a versatile tool that can be adapted to advance many quality and patient safety objectives.<sup>3</sup>
  
- ❑ Simulation in situ can reveal differences between “work-as-imagined” and “work-as-done”.<sup>4</sup>
  
- ❑ There are several approaches to simulation training and depending on the material being taught, several methods may be used<sup>4</sup>:
  - Part-task trainers – life-like simulators used to train specific clinical skills
  - Full-scale simulators – full-body manikin that range from low fidelity (offering anatomic landmarks) to high-fidelity (with realistic physiologic responses)
  - Standardized patients

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### Assessment

- Simulation can be used in a variety of settings<sup>4</sup>:
  - Simulation centers – specialized learning centers often designed to replicate the variety of clinical spaces learners work in (e.g., ambulatory offices, operating rooms, and emergency rooms), as well as the equipment they work with
  - Classrooms and skills or task labs – organizations that do not have a simulation center can use a classroom, break room, or a skills/task lab for simulation. Part- and full-scale simulators can be set up on tables to demonstrate and practice skills.
  - In situ simulation – simulation carried out in the actual clinical environment with the providers who work in that location. It may involve use of part-task or full-scale simulators and/or standardized patients. NOTE: special care needs to be taken when conducting simulations in these clinical environments because of the potential risks to patients and staff safety
  - Virtual reality – learners are immersed in a highly realistic digital clinical environment.
  - Augmented reality – a variation of virtual reality in which images are superimposed over the users view of the world. This also offers distance learning approaches.

Recommendation	Simulation to Improve Patient Safety	Yes	No	What action is needed?
	<p>Are you aware that the most important areas to consider when creating a simulation to improve patient safety include:</p> <ul style="list-style-type: none"> <li>➤ <b>Clarity about the purpose and the goals</b> of individual simulations or the complete simulation program.</li> <li>➤ <b>Thoughtful design</b> of simulation and selection of simulators.</li> <li>➤ <b>Proper preparation of</b> potential participants before simulation.</li> <li>➤ <b>Skilled debriefing</b> after simulations, with lessons regularly shared to inform quality and safety activities</li> </ul> <p><i>See Issue Brief Simulation To Improve Patient Safety: Getting Started<sup>3</sup></i></p>			
	<p>Have you considered incorporating simulation when conducting an RCA to better understand factors that contributed to the event of patient harm?</p> <p><i>See Issue Brief Simulation To Improve Patient Safety: Getting Started<sup>3</sup></i></p>			
	<p>Have you realized the value of an in situ simulation to visualize the difference between “work-as-imagined” and “work-as-done” so that resource limitations, missing equipment, unbalanced workloads, and other potential local and systemwide conditions can be identified.</p> <p><i>See Issue Brief Simulation To Improve Patient Safety: Getting Started<sup>3</sup></i></p>			

Recommendation	Simulation to Improve Patient Safety	Yes	No	What action is needed?
	<p>Have you considered utilizing simulation to adopt and adapt best practices for:</p> <ul style="list-style-type: none"> <li>➤ failure modes and effects analysis (FEMA)</li> <li>➤ probabilistic risk assessment (PRA)</li> <li>➤ responses to adverse event concerns</li> <li>➤ or other methods used to anticipate, identify, and mitigate hazards and prioritize interventions.</li> </ul> <p><i>See Issue Brief Simulation To Improve Patient Safety: Getting Started<sup>3</sup></i></p>			
	<p>Have you purposefully created an environment conducive to learning when doing a simulation by including the following:</p> <ul style="list-style-type: none"> <li>➤ individualized feedback</li> <li>➤ cognitive interactivity</li> <li>➤ deliberate practice</li> <li>➤ longer duration of curricula</li> </ul> <p><i>See Simulation Training<sup>4</sup></i></p>			
	<p>Have you reviewed the evidence-based best practice standards for simulation provided by professional organizations?</p> <p><i>See Simulation Training<sup>4</sup></i></p>			

Recommendation	Simulation to Improve Patient Safety	Yes	No	What action is needed?
	<p>Have you included the following actions to encourage participation and collaboration in your organization’s simulation activities:</p> <ul style="list-style-type: none"> <li>➤ designing introductory simulations that are supportive, engaging, and rewarding.</li> <li>➤ focusing on improving healthcare systems, not healthcare providers.</li> <li>➤ ensuring that participants are oriented to the objectives of the simulation.</li> <li>➤ optimizing the direct and secondary benefits by addressing organizational priorities.</li> <li>➤ providing formal credit toward credentialing, maintenance of certification, mentoring, or other educational, research, publication, or administrative goals.</li> <li>➤ using simulation to meet Joint Commission accreditation standards for annual drills to determine system issues as part of ongoing quality improve efforts in maternal safety</li> <li>➤ respecting the concurrent clinical care responsibilities of participants by postponing simulations during periods of increased patient acuity, increased patient census, or limited staffing.</li> </ul>			

## References

1. Aebersold, M. The history of simulation and its impact on the future. *AACN Adv Crit Care*. 2016;27(1): 56-61.
2. Sheen, J., Goffman, D. Emerging role of drills and simulations in patient safety. *Obstet Gynecol Clin North Am*. 2019;46(2):305-315.
3. Agency for Healthcare Research and Quality. Issue Brief Simulation to Improve Patient Safety: Getting Started. July 2024. AHRG Publication No. 24-0055. Available at: <https://www.ahrq.gov/patient-safety/resources/simulation-issue-brief.html>.
4. Edwards, J., Nichols, A., Bakerjian, D. Simulation Training. March 1, 2023. Available at: <https://psnet.ahrq.gov/primer/simulation-training#>
5. Deutsch, E. Bridging the Gap Between Work-as-Imagine and Work-as-Done. *PA Patient Saf Advis*. 2017; 14(2):80-83. Available at: [https://patientsafety.pa.gov/ADVISORIES/pages/201706\\_80.aspx](https://patientsafety.pa.gov/ADVISORIES/pages/201706_80.aspx)

## Additional Resources

1. Diaz-Navarro, C., Armstrong, R., Chametski, M, et. al. Global consensus statement on simulation-based practice in healthcare. *Sim Healthcare*. 2024; 19:e52-e59.
2. Healthcare Simulation Standards of Best Practice. 2024. Available at: <https://www.healthysimulation.com/>.
3. Lewis, K., Ricks, T., Rowin, A., et. Al. Does Simulation Training for Acute Care Nurses Improve Patient Safety Outcomes: A Systematic Review to Inform Evidence-Based Practice. *World view on Evidence-Based Nursing*. 2019| 16:5, 389-396,
4. Deutsch, E., Patterson, M. Perry, S. A New Pairing: Root Cause and Success Analysis. *Pa Patient Saf Advis*; 2018; Sep; 15(3).