

PATIENT SIMULATION

Patient Simulation in Pharmacy Education

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Pharmacy education continues to evolve, thus demanding innovative active learning to enhance pharmacotherapeutic knowledge and clinical skills. Simulation-based pharmacy education enhances students' fundamental knowledge, improves learner confidence, enhances clinical performance, stimulates critical thinking, and decreases medication administration errors. Given educators' increasing and innovative use of simulation throughout pharmacy and interprofessional curricula, a supplement issue that reviews the status of simulation in pharmacy education and relevant issues surrounding it seemed merited. As technology continues to advance, methods of knowledge delivery will need to adjust rapidly. The Pharmacy Simulation supplement will explore the role of simulation education in the development of clinical skills, enhancement of critical-thinking skills, and performance of critical assessment in pharmacy students; review opportunities to improve patient safety; and discuss simulation's use in introductory pharmacy practice experiences (IPPEs).

With the integration of simulation methods into pharmacy education, the Accreditation Council on Pharmacy Education (ACPE) has approved the use of simulation in IPPEs for up to 20% or 60 hours of the total 300 hour experiential education requirement.¹ Use of high-fidelity human patient simulation is an example of an acceptable method of simulating patient care activities. A critical element in the use of simulation as a component of IPPEs is that the educational encounter connects the pharmacy or patient care activity to a high-fidelity human patient simulator. Both medical and nursing educators also recognize the completion of simulated patient care exercises as acceptable experience within their professional curriculums and have provided guidance in the effective use of simulation in education.²⁻⁴

Several pharmacy programs use high-fidelity human patient simulation at various points in their curricula

while others have integrated it successfully throughout the curriculum. High-fidelity human patient simulation in this supplement refers to the use of simulators with programmable physiologic responses to disease states, interventions, and medications. These simulators can speak, breathe, have realistic heart, lung, and bowel sounds, display hemodynamic parameters in real time, seize, sweat, display cyanosis, and other physiologic responses at various levels depending on the model used. The initial costs of implementing this type of learning include a simulator (\$16,000 to \$90,000), a functional space for the equipment, and simulation specialist support to begin programming. Patient simulation and debriefing can help to identify individual learner needs and address them immediately. For example, if a student is on an acute care/critical care experience and has not witnessed a cardiac arrest (or only has seen one from the hallway while 20+ healthcare workers and trainees take care of the patient), educators can simulate a cardiac arrest using a patient simulator and allow the student to learn about the underlying disease, see the rhythm on the heart monitor, decide on drug therapy and dose, mix the necessary medications, and observe their effects on the patient. Because of this ability to control and monitor every aspect of the event (patient's symptoms, vital signs, etc) while creating a realistic experience for the student, the simulation laboratory can be a more robust learning environment than the patient's bedside. Some examples of situations where faculty members may want to provide a standardized experience with simulation include: cardiac arrest, respiratory arrest, surgeries, allergic reactions, cardiac pulmonary resuscitation, basic first aid, myocardial infarction, stroke procedures, renal failure, bleeding, trauma, etc. While simulation should not replace students spending time with real patients; it provides opportunities to prepare students, complements classroom learning, fulfills curricular goals, standardizes experiences, and enhances assessment opportunities

In this supplement, Dr. Crea summarizes the development of practice skills through the use of simulation. The opportunity to apply foundational knowledge learned in the classroom and to enhance patient care skills that simulation affords makes it a valuable addition to traditional

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teaching approaches. By building a solid foundation of instruction delivery, pharmacy educators can streamline the learning and assessment of patient care concepts while potentially achieving higher-order learning. Dr. Vyas and colleagues look at these higher-order thought processes, problem-solving skills, and critical thinking, as well as how simulation can complement what is taught in the curriculum.

As Dr. Bray and colleagues demonstrate, simulation offers unique learning environments with adaptable and practical assessment opportunities. Assessment in the simulated environment can be immediate, reliable, consistent, formative, summative, and valuable. Simulation offers comprehensive assessment capabilities that can complement current teaching methods or fill knowledge gaps. Dr. Kane and colleagues explore the impact of simulation education on direct patient care and outline refinements to this educational tool that ultimately could improve patient safety. Finally, Dr. Travlos and colleagues discuss the ACPE's guidance on the use of simulation in IPPEs.

This supplement hopefully will encourage discussion within pharmacy education on how simulation can be used within the curriculum to improve student learning and ultimately improve patient care.

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