

Simulation as a Learning Tool in the Oncology Setting

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Simulation-based education in medicine represents a teaching paradigm shift. David Gaba, associate dean for Immersive and Simulation-Based Learning at Stanford University School of Medicine, describes simulation as a technique, not a technology, that recreates real patient experiences and gives participants the opportunity to learn concepts, develop skills, and practice without causing harm to the patient (Gaba, 2012). Research has shown simulation improves learning for both medical and nursing students in many different clinical domains (Gaba, 2012). Simulation can involve use of high-fidelity mannequins, role-playing, storytelling, or standard patient actors. Currently, there are no templates on how to do simulation training, but varied methods are used in medical schools, schools of nursing, and health-care organizations (Patow, 2005).

Okuda et al. (2009) indicate a current trend of patient concern regarding being “practiced on” by medical or nursing students in the

health-care setting. Simulation offers a vehicle for clinical outcome improvement along with a reliable learning outcome measurement. Participants in the simulation experience learn principles of teamwork and communication. Simulation can effectively assess knowledge gaps and provide a safe and supportive learning environment.

BACKGROUND

In nursing education, there is rarely a substantial focus placed on teaching oncology content. Historically, in nursing programs, content is presented on fundamental nursing practice, medical surgical nursing, maternal child, and mental health nursing. Various frameworks being used in schools of nursing do not focus in any length on teaching oncology concepts or topics. This article describes a nurse faculty program to train newly graduated, novice RNs for the role of an oncology nurse using simulation as a learning tool. The author of this article participated in the design and implementation of the program.

The impetus for this project involved a partnership between the

College of Southern Nevada (CSN) School of Nursing, the Nevada Cancer Institute, a Department of Labor Grant, and the Nevada Workforce Development to train graduates from the CSN associate degree nursing program into the field of oncology nursing. Nurses attended monthly simulation sessions for a total of 18 months and participated in high-fidelity oncology emergency simulations with a two-person team consisting of an oncology-experienced nursing faculty member and a school lab/simulation technician. Ten oncologic emergencies were written, designed, and implemented. Nurse participation involved mostly novice level nurses with little to no oncology experience.

PROJECT GOALS AND METHODS

The goals of the project in relationship to the graduate nurses participating were to teach content regarding 10 oncology scenarios commonly seen in the oncology population. This teaching included experiential learning through high-fidelity simulation, debriefing, evaluation, posttest questions, PowerPoint presentations, and videos. At the conclusion of 1 year, graduate nurses would have the opportunity to sit for the OCN exam, the fee for which would be covered by their employer. Graduate nurses participating in the project also gained valuable experience working with oncology patients and then could have the opportunity to seek an RN position in oncology once their internship was completed.

SIMULATION DESIGN

Scenarios developed and evolved using the real-life experiences of the oncology nurse faculty member or were gleaned from published oncology case studies. Oncologic emergencies to be studied included anaphylaxis, tumor lysis syndrome, bowel obstruction, hypercalcemia, neutropenic sepsis, disseminated intravascular coagulation (DIC), cardiac tamponade, increased intracranial

pressure, spinal cord compression, and syndrome of inappropriate antidiuretic hormone (SIADH). Novice nurses were not necessarily informed about which oncology emergency was occurring prior to simulation. They were tasked to use their knowledge and assessment skills to determine the problem and to implement nursing interventions to ensure the best patient outcomes.

Groups of eight students participated in any given session. Four students participated in the simulation, while the other four were observers, thus having the opportunity to assess their peers' competency in performing the simulation activity. The mannequin was programmed to have vital signs, voice, or sound, and nurses played the role of physician, charge nurse, staff nurse, and/or family member. Each participant had a dialog sheet that they followed to act in the scenario. Most scenarios included lab results or test reports that needed to be evaluated.

The nursing faculty took anecdotal notes after each simulation activity and shared the analysis with the appropriate stakeholders. When each scenario was developed, journal articles relevant to the topic were used to ensure that evidence-based practice was current. The articles were also provided to each graduate nurse for discussion after debriefing. This practice enhanced learning and understanding of any new concepts acquired during the simulation.

SIMULATION TECHNOLOGY

Minimal research has been done on the effectiveness of using simulation in nursing education. Today's health-care system emphasizes the role of providing "accurate and safe care to patients" (Sanford, 2010). Simulation is emerging as an alternative teaching strategy, as it encompasses the use of theory, assessment, technology, pharmacology, and clinical skills (Rauen, 2004). Through experiential methods, oncology nurses learn the appropriate and evidence-based way to treat patients when an oncologic emergency occurs.

Teaching with technology is an alternative method to face-to-face education. It is not necessarily better or worse; it is just different (Bates & Poole, 2003). Many of the participating nurses felt pushed out of their "comfort zone" as they were propelled into unknown situations where they had to determine the best route to take. Through



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the use of high-fidelity simulation, novice nurses had the opportunity to be exposed to varied oncologic emergencies and were evaluated and debriefed on their use of nursing knowledge and critical thinking pathways while participating in the simulation. Quality and Safety Education for Nurses (QSEN) competencies provided the basis for assessment and evaluation of whether participants demonstrated knowledge and competency in treating the oncology emergency.

Current trends in nursing education and health care place a high importance on achievement and flawlessness in performing any nursing skill or intervention. Simulation allows participants to challenge themselves and make errors in a safe and supportive environment with no harm being done to a live patient (Arafeh, Snyder Hansen, & Nichols, 2010). The oncology simulations done with novice oncology nurses were performed in a way that did not place significance on achievement, but focused instead on learning and pushing each participant toward a higher level of critical thought and competence.

INSTRUCTOR METHODS/DEBRIEFING

Debriefing is a critical component in the simulation experience (Arafeh, Snyder Hansen, & Nichols, 2010). The debriefing session following each oncology simulation was implemented as a teachable moment. One goal was to encourage participants to use critical thinking and limited nursing experience—along with recent fundamental nursing knowledge acquired in nursing school—to assess present knowledge and nursing competency.

The debriefing period is invaluable, as it is the portion of simulation during which analysis and perspective emerge as one. Participants are given the opportunity to reflect and discuss their clinical performance in meeting scenario objectives that are aligned with current oncology nursing practice and evidence-based guidelines. Using a real-life basis for the scenarios proved to be most beneficial to the novice nurses.

Upon completion of the simulation scenario, participants were evaluated by their instructor. Background information was provided on the specific oncologic emergency in a teachable, non-threatening way through handouts, group question-and-answer sessions, videos, and student

participation. As mentioned previously, recent journal articles were provided to the novice nurses as “take-home” items that highlighted current evidence-based practice related to the oncologic emergency being studied that day. Participants were able to discuss what had been done “right” and what could have been done better. Arafeh and colleagues (2010) concur on the importance of ensuring constructive feedback during these sessions using open group discussion in an environment supporting open communication and group learning methods.

MEASUREMENT OUTCOMES

Project outcomes were measured through graduate nurse self-evaluation and instructor evaluation of performance using QSEN guidelines as a framework. Domains included patient-centered care, teamwork and collaboration, evidence-based practice, quality improvement, safety, and informatics. Each domain included knowledge, skills, and attitudes relevant to the particular scenario or oncologic emergency. Peers and faculty members assessed participants with respect to whether the necessary performance requirements were appropriately achieved. See the Appendix at the end of this article for more details on a sample scenario and the associated objectives and assessment rubrics.

Graduate nurses' views of simulation were not consistent at any given time. Some experienced much angst and did not want to be “on stage.” Others stated they learned best from the debriefing moments that occurred after the simulation completed. Teamwork was often viewed when a strong nurse was placed with a weaker one who needed support in making the appropriate decision in patient care. Faculty members noticed that after four simulation experiences, most nurses experienced less angst and enjoyed the learning experience much more.

DRAWBACKS AND MERITS OF SIMULATION

There are many advantages and disadvantages to teaching with simulation. One disadvantage of simulation is that it requires significant preparation, support, and buy-in from those involved in the activity (Okuda et al., 2009). Nursing faculty

members never exposed to the concept of high-fidelity simulation are often hesitant to facilitate activities due to lack of past exposure and minimal training. In addition, resources in nursing schools are not always optimal. In the experience described in this article, a two-person team had to coordinate the whole process, which proved to be quite challenging. Neither member had had formal training in simulation prior to participating in this project. Having QSEN competencies and simulation examples available prior to the start of the project provided a framework to work from. Graduate nurses participating in the oncology simulations often felt that they were on stage or felt uncomfortable not knowing what was expected of them. They believed that it would be somehow held against them if they could not attain what was expected of them by faculty. The nurses lacked clinical experience in oncology and had no oncology hospital experience, which placed them at a disadvantage.

Despite these disadvantages, the advantages to simulation are numerous. Being in a safe environment where making mistakes is a part of learning decreases the risk of causing harm to a live patient. Research indicates that simulation enhances learning by improving a nurse's skills and providing educators with a method to assess a student's understanding of the concepts being taught (Patow, 2005).

CONCLUSIONS

High-fidelity simulation is evolving and emerging as an alternative or adjunct method to clinical experience in many medical settings, including oncology. Methods may vary among individuals, but the essential first steps in developing a simulation training program include coming up with a case study that revolves around a medical concept, determining course outcomes and course expectations for the learner, and structuring evaluation tools that assess whether outcomes have been achieved.

Although the program described in this article focused on nurses, the benefits of simulation training can also be applied to advanced practitioners in oncology: nurse practitioners, clinical

nurse specialists, and physician assistants. These clinicians could benefit from an adjunct learning strategy such as simulation because practice and repetition usage in simulation aid in acquiring medical expertise and comprehension.


The shortage of medical professionals will continue, and the lack of clinical experiences for novice oncology nurses will endure. The aging of our nursing workforce impels educators to come up with new methods to train our future oncology nurses in a safe, effective environment. Simulation provides a safe method to teach, engage, and build confidence in novice nurses as they transition to a higher level of understanding of how to respond to oncologic emergencies. ●

Disclosure

The author has no conflicts of interest to disclose.

References

- Arafeh, J. M., Snyder Hansen, S., & Nichols, A. (2010). Debriefing in simulated-based learning, facilitating a reflective discussion. *Journal of Perinatal Neonatal Nursing, 24*(4), 302–309. <http://dx.doi.org/10.1097/JPN.0b013e3181f6b5ec>
- Bates, A. W., & Poole, G. (2003). *Effective teaching with technology in higher education. Foundations for success*. San Francisco, CA: Jossey-Bass.
- Gaba, D. (2012). Video transcript: Simulation in medical education. Retrieved from <http://www.mdanderson.org/transcripts/ace-trans-template.htm>
- McGaghie, W. C., Issenberg, S. B., Cohen, E. R., Barsuk, J. H., & Wayne, D. B. (2011). Does simulation-based medical education with deliberate practice yield better results than traditional clinical education? A meta-analytic comparative review of the evidence. *Academic Medicine, 86*(6), 706–711. <http://dx.doi.org/10.1097/ACM.0b013e318217e119>
- Okuda, Y., Bryson, E. O., DeMaria, S., Jacobson, L., Quiñones, J., Shen, B., & Levine, A. (2009). The utility of simulation in medical education: What is the evidence? *Mount Sinai Journal of Medicine, 76*, 330–343. <http://dx.doi.org/10.1002/msj.20127>
- Patow, C. A. (2005). Advancing medical education and patient safety through simulation learning. *Patient Safety & Quality Healthcare*. March/April. Retrieved from <http://www.psqh.com/marapr05/simulation.html>
- Rauen, C. A. (2004). Simulation as a teaching strategy for nursing education and orientation in cardiac surgery. *Critical Care Nurse, 24*, 46–51.
- Sanford, P. G. (2010). Simulation in nursing education: A review of the research. *Qualitative Report, 15*, 1006–1011.

Please see Appendix on next page. 

Appendix: Clinical Simulation, Non-Small Cell Lung Cancer Patient

<p>Simulation Design: QSEN Competencies of Safety, Evidence-Based Practice, Teamwork and Collaboration, and Patient-Centered Care Expected Simulation Run Time: 30 min Guided Reflection Time: 30 min</p>	
<p>Today's Date: November 18, 2011 Brief Description of Client Name: George Jones Gender: Male Age: 60 years old Race: Caucasian Weight: 225 lb Height: 6 ft Major Support: Wife (Glenda) and daughter (Tracie) Allergies: NKDA</p> <p>Attending Physician/Team: Nurse: Mary Allen, RN, OCN Charge Nurse: Julie Whitaker, BSN, RN, OCN Oncologist: Alan Jenkins, MD</p>	<p>Psychomotor Skills Required Prior to Simulation Knowledge of IV chemotherapy: How to set up tubing and give premedications; side effects to anticipate; how to react to situational responses to therapy</p> <p>Cognitive Activities Required Prior to Simulation (i.e., independent reading, video review, computer simulations, lecture): Review <i>Third Edition Chemotherapy and Biotherapy Guidelines and Recommendations for Practice</i> (2009) regarding chemotherapy administration and management of NSCLC.</p>
<p>Past Medical History: Diagnosed with NSCLC several months ago On chemotherapy regimen of paclitaxel/carboplatin on day 1 every 21 days</p>	<p>Received 6 cycles of chemotherapy thus far. Is here today to receive his 7th cycle of chemotherapy. His wife is ill and his daughter is present at his side during the treatment. She is dotting of her father's needs and asks a lot of questions of the nursing staff.</p>
<p>History of Present illness: Patient has tolerated all of his chemotherapy cycles thus far. The oncologist anticipates giving the patient a few more cycles of treatment and then doing a CT scan to evaluate the effectiveness of therapy.</p>	<p>Patient is receiving his 7th cycle of carboplatin/paclitaxel. While receiving the carboplatin he has a change in status, with edema and redness noted on his face, neck, and chest. He has respiratory distress with a marked change in his vital signs: 98.7°, 115, 30, & 60/40.</p>

Case Study

George Jones was diagnosed with NSCLC several months ago. His chemotherapy regimen consists of carboplatin and paclitaxel on day 1 every 21 days for 6 or more cycles. Today George is to receive his 7th cycle of treatment. So far, he has responded well to therapy, and his physician is considering doing a CT of the chest after a few more cycles of treatment to evaluate effectiveness of therapy. He is currently in the chemotherapy infusion area receiving his dose of carboplatin. The charge nurse, who is rounding, notices something strange about Mr. Jones. Edema and redness are present on his face, neck, and chest. He alerts Mary, the chemotherapy nurse, to let her know he isn't feeling well. All of a sudden, he gasps for air. His vital signs are as follows: temperature 98.7°, pulse 115, respiration rate 30, blood pressure 60/40.

How should the chemotherapy nurse proceed? What do you anticipate is happening? What medications or treatments can be used to help stabilize this patient? Why did this situation occur?

Chemotherapy Orders

Carboplatin: AUC of 6, IV on day 1

Paclitaxel: 175 mg/m² IV over 3 hr on day 1

Premeds: Decadron 20 mg IV 30 min prior to start of chemo

Benadryl 50 mg IV 30 min prior to start of chemo

Cimetidine 300 mg IV 30 min prior to start of chemo

Simulation Learning Objectives

1. Integrate understanding of multiple dimensions of patient-centered care: Patient/family/community preferences, values; coordination and integration of care; information, communication, and education; physical comfort and emotional support; involvement of family and/or friends; transition and continuity
2. Act with integrity, consistency, and respect for differing views
3. Assume the role of team member or team leader based on the situation
4. Value the concept of evidence-based practice as integral to determining best clinical practice
5. Demonstrate effective use of strategies to reduce risk of harm to self or others
6. Value vigilance and monitoring by patients, families, and other members of the health-care team
7. Communicate observations or concerns related to hazards and errors to patients, families, and the health-care team
8. Minimize risk of harm to patients and providers through both system effectiveness and individual performance

Program/Curriculum-Specific Objectives

The oncology nurse will understand all of the following:

1. Preadministration guidelines for chemotherapy
2. Clinical manifestations for hypersensitivity and anaphylaxis
3. Emergency management of anaphylaxis:

Students should demonstrate some of the following behaviors or knowledge:

- a. STOP the drug infusion and maintain a separate IV line with NS.
- b. Have one nurse stay with the patient while another notifies the physician and the emergency team.
- c. Position the patient in a supine position if no vomiting or shortness of breath; elevate the legs.
- d. Monitor vital signs frequently.
- e. Administer oxygen and maintain the patient's airway.
- f. Be prepared for sudden need for CPR; make crash cart available close by.
- g. Administer medications under physician order to treat symptoms.
- h. Provide emotional support to patient and family.
- i. Document treatments and patient's response in the medical record.

References

- Chu, E. (2005). *Pocket guide to chemotherapy protocols*. Jones and Bartlett: Sudbury, MA.
- Itano, J. K., & Taoka, K. N. *Core curriculum for oncology nursing* (4th Ed.). Elsevier Saunders: St. Louis, MO.
- Polovich, M., Whitford, J. M., & Olsen, M. (2009). *Chemotherapy and biotherapy guidelines and recommendations for practice* (3rd Ed.), Oncology Nursing Society: Pittsburgh, PA.
- QSEN Coordinated Student Learning Objectives for Simulation Experience (KSAs), http://www.qsen.org/Ksas_graduate.php

Performance Checklist				
Exceeds Expectations	Meets Expectations	Does Not Meet Expectations	Performance Criteria	Comments
			Stops the drug infusion and maintains a separate IV line with NS	
			Nurse stays with the patient while another notifies the MD and emergency team	
			Positions patient in supine position and elevates lower extremities	
			Monitors vital signs q15min	
			Administers oxygen and maintains patient's airway	
			Makes crash cart available (anticipates the need for CPR)	
			Administers medications ordered by physician	

Observer Evaluation of Scenario			
Primary Nurse	Physician	Charge Nurse	Daughter/Family
Exemplars:	Exemplars:	Exemplars:	Exemplars:
Areas for improvement:	Areas for improvement:	Areas for improvement:	Areas for improvement: