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Patient Safety Improvement Through In Situ Simulation Interdisciplinary Team Training

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In situ simulation is an education strategy that promotes patient safety and enhances interdisciplinary teamwork. When a patient is experiencing an acute health status change or a rapidly emerging condition, teamwork is necessary to adequately and appropriately provide treatment. A unit-based quality improvement project was designed to enhance these skills. In situ simulation was used as the training venue for nurses and physicians to practice the techniques recommended in the evidence-based team-building model, TeamSTEPPS®.

Key Words: **In situ, in situ simulation, interdisciplinary safety, simulation, team training, TeamSTEPPS®.**

Objectives:

1. Discuss the importance of interdisciplinary teamwork in the clinical setting.
2. Describe the impact in situ training for emergency situations may have on RNs' and urology residents' perceptions of team performance.

In 2000, the Institute of Medicine (IOM) published a call for action in the seminal work *To Err Is Human: Building a Safer Health System.* Within this call for action was the recommendation that health care organizations incorporate safety principles and systems to improve patient safety. The safety principles included promoting effective teamwork and creating learning environments. Simulation is increasingly used in the health care industry as a patient safety tool (Gaba, 2004; Patterson, Geis, Falcone, LeMaster, & Wears, 2013; Ziv, Small, & Wolpe, 2000). Simulation scenarios provide opportunities for health care professionals to practice evidence-based communication and team coordination skills.

Interdisciplinary teamwork has become essential because of the growing complexity of health care systems that requires teams of experts to adapt to avoid error and enhance safety (Burke, Salas, Wilson-Donnelly, & Priest, 2004). A team of experts does not automatically create an expert team (Burke et al., 2004). Nurses, physicians, and other health care professionals need preparation to fully comprehend the importance of teamwork and to develop skills, knowledge, and attitudes regarding communication, backup behavior, and cross-monitoring to coordinate efforts toward a shared goal (Weaver, 2011).

Literature Review

Sammer, Lykens, Singh, Mains, and Lackan (2010) generated a conceptual framework to guide health care leaders in fostering a culture of patient safety. Essential constructs of the framework included leadership, teamwork,

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evidence-based practice, communication, and establishment of a just culture that promotes learning and is patient-centered. Teamwork is a vital element of organizations striving for high reliability, wherein the actions of nurses, physicians, and other health care professionals must be coordinated to achieve safe patient care (Baker, Day, & Salas, 2006).

Development of team learning and support of caregivers at the point of care are paramount for organizations promoting a culture of safety (Roberts, Yu, & van Stralen, 2004). Ideally, teams that work together across disciplines are trained together to optimize patient care (IOM, 2000). Although this joint training approach is a basic tenet, the preferred mechanism for learning – and even the ideal curriculum – is largely unknown. Nonetheless, nurses and physicians need to communicate and collaborate as an interdisciplinary team, including the use of evidence-based communication skills (Greiner & Knebel, 2003).

Respectful communication serves as a foundation for establishing partnerships between persons by engaging them in an information exchange that develops mutual understanding, shared knowledge, and consensus, and also leads to identifiable action (Schiavo, 2007). In general, nurses and physicians differ in their communication styles. According to Leonard, Graham, and Bonacum (2004), nurses tend to describe the patient's response to illness in the broad perspective using narrative language while physicians seem to prefer concise and direct statements. Effective team performance and positive patient outcomes rely on communication that bridges these style differences and creates a shared mental model about the patient's situation.

It is essential that nurses effectively exchange information with other health care providers when critical changes occur in the condition of patients to ensure quality patient outcomes and safety (Miller, Riley, & Davis, 2009). In a study designed to assess for nursing behaviors deemed necessary for optimal interdisciplinary team functioning and communication, Miller et al. (2009) reported that key nursing behaviors were not consistently observed during simulation scenarios based on real patient situations.

Team training for core skills and behaviors has been described as a tool to achieve high reliability in health care (Frankel, Leonard, & Denham, 2006). The U.S. Agency for Healthcare Research and Quality (AHRQ) (2008a) developed the training program TeamSTEPPS® to improve team performance in health care through the key principles of leadership, situation monitoring, mutual support, and communication. In a systematic review of the literature on the use of in situ simulation for continuing education, Rosen, Hunt, Pronovost, Federowicz, and Weaver (2012) reported that TeamSTEPPS® was one of the established programs used for teamwork training. Communication techniques recommended by AHRQ (2008b) include a) situation, background, assessment, and recommendation (SBAR) technique, a structured approach when relaying critical patient information; b) call-out, assigning tasks, and providing status reports verbally to the entire response team; and c) check-back – instructions are repeated by the receiver to ensure accurate understanding. In addition, the "CUS" words "I am **C**oncerned," "I am **U**ncomfortable," and "This is a **S**afety issue" (p. 24) can effectively communicate the seriousness of a situation to the receiver.

Hobgood et al. (2010) conducted a randomized controlled trial of four team-training modalities: didactic lecture, lecture with audience response, role-play, and human patient simulation with nursing and medical student teams. The investigators found no significant difference in outcomes to support that one educational modality was better than another. Each different training group demonstrated significant improvement in their attitudes and knowledge of teamwork. Following a review of 29 articles, Rosen et al. (2012) reported that in situ simulation has demonstrated a positive impact on learning. Simulation tools range from simple models and mannequins to high-tech procedural and realistic interactive patient simulators (Ziv et al., 2000).

Simulation training, most commonly in a high-fidelity simulation center, has been identified as an accepted way to improve team performance (Baker et al., 2006). Simulation can also be used in actual clinical work units to provide additional opportunity to practice and embed teamwork skills. In situ simulation offers the distinctive ability to explore the complexities of clinical and interpersonal dynamics simultaneously (Guise et al., 2010). Simulation also provides an environment for interdisciplinary teams to learn from action reviews of near-miss situations, adverse events, or mistakes made by the team (Ziv et al., 2000).

Local Problem

In 2009, several registered nurses (RNs) and urology residents participated in patient scenarios focused on responding to emergent patient conditions, including sepsis and hemorrhage, at a high-fidelity simulation training center (Klipfel et al., 2011). The unit-based safety team members recognized that the knowledge and team-building skills learned during training needed to be reinforced. In an effort to build and sustain an enhanced commitment to team-

work and communication into the everyday realities of the clinical setting, the safety team chose the education strategy of in situ simulation. Cases were chosen from interdisciplinary after-action reviews, and urology resident input was sought. In a previous program using didactic, one-on-one strategies, nurses reported an increase in confidence and skill in recognizing and responding to a declining patient status (Jacobson et al., 2010).

Methods

Quality Improvement Questions

The quality improvement (QI) project was designed to determine the impact of participation in an in situ training emergency scenario on RNs' and urology residents' perceptions of team performance. Specific aims included three of note.

- Can in situ simulation training improve the interdisciplinary team performance of nurses and physicians in their response to a simulated patient experiencing an acute status change (urosepsis) or emergent condition (cardiopulmonary arrest)?
- Can in situ simulation be feasibly implemented on an inpatient general surgical unit with interdisciplinary team membership and satisfactory trainee reaction?
- Can in situ simulation serve as a mechanism for practicing evidence-based communication skills between nurses and urology residents?

Ethical Issues

The focus of this QI project was to improve the interdisciplinary communication and teamwork on one general surgical unit, and thus, was determined to be exempt by the health care facility's institutional review board. Participation was voluntary, and data were de-identified and aggregated. The video was stored on a private file on a shared computer drive accessible only to safety team members. The clinical needs of currently hospitalized patients were carefully considered in all training exercises. The training did not interrupt the normal patient flow or affect patient staffing. It was understood by all staff involved that the simulation would be stopped if an actual patient emergency occurred on the unit during the training. Unit emergency equipment was not used so that the equipment was available for any real patient emergency. Identical, duplicate equipment (see Table 1) was available through the department of nursing, and delivery was arranged by a nurse education specialist.

Table 1.
Equipment Used in the Simulation

- Handheld digital recorder
- Tripod
- Basic mannequin
- Backboard
- AED cart (training)
- Emergency respiratory equipment (training)
  - Blue respiratory bag adult and child masks
  - Resuscitation bag with mask
- Portable suction and tubing
- Pulse oximeter
- Temperature probe
- IV pumps
- IV fluids
- Noninvasive blood pressure cuff
- Urinary catheter
- Hospital bed

Notes: AED = automatic external defibrillator; IV = intravenous.

Instruments

Two instruments were used to measure project outcomes. The Mayo High Performance Teamwork Scale consisted of 16 critical behaviors considered valuable in effectively managing crisis situations (Malec et al., 2007). The scale was developed using a psychometric testing approach. Malec et al. (2007) reported that this scale demonstrated "internal consistency and construct validity by Rasch analysis (person reliability = 0.77; person separation = 1.85; item reliability = 0.96; item separation = 5.04) and traditional psychometric (Cronbach's alpha = 0.85) indicators" (p. 4). The Mayo High Performance Teamwork Scale provided a method for participants to rate the performance of the team following the training scenarios. Trending the ratings for each behavior can delineate the effectiveness of the simulation activity for the program planners and for direct process improvements. In terms of benefit to individuals, completion of the scale can increase awareness of skills inherent in high-performing teams and provide feedback on strengths and weaknesses.

Participants were also surveyed about their reaction to the training. The 10-question post-satisfaction survey was developed by the quality improvement project team leader to seek feedback about the scenario realism, feelings of usefulness about the training, and feelings about the effectiveness of the training as a tool to practice teamwork and communication skills. The purpose of the survey was to evaluate the staff members' perceptions regarding the development of skills in managing emergent patient situations. The survey used a numerical scale ranging from 1 = strongly disagree to 5 = strongly agree.

Simulation Development

The nursing team developed scenarios of de-identified patient cases with help from the clinical nurse specialist. Using the Plan, Do, Study, Act (PDSA) process improvement method (Institute for Healthcare Improvement [IHI], 2011), the team tested three

Table 2.
Simulation Participants and Team Member Responsibilities

Participants	In Situ Simulation Team Members and Responsibilities
Charge nurse	Voice of the patient
On-coming nurse	Team member responsible for videotaping
Off-going nurse	Team member responsible for prompting, giving information, and directing the scenario as needed
Urology resident	Team member responsible for orienting and debriefing

simulated medical emergencies on a general surgical patient care unit. The first iteration of the simulation design was limited to staff RNs. Following three PDSA cycles, the interdisciplinary team analyzed the suggestions of the RNs and physicians, in situ simulation evaluations, and literature review results. These data were used only to design the training program. Enhancements made to the process included a) integration of the nursing bedside handoff using SBAR, b) addition of urology residents as participants, c) incorporation of protected participation time for RNs and urology residents, d) use of scenarios of patients with acute clinical deterioration, and e) communication pathways (pager and telephone) routinely used by urology residents and nurses to exchange information that were written into the scenario. Effective communication was required to identify the needed action. After the in situ simulation scenario process was well-defined, six training cycles with urology residents and RN teams were completed. The in situ simulation process incorporated the major categories of briefing, training scenarios, and debriefing. The TeamSTEPPS® guide (AHRQ, 2008b) was used to facilitate development of the three phases of the in situ simulation.

Participants

An interdisciplinary participant roster was developed on the basis of real-world availability of staff (e.g., the charge nurse). The four participant roles were charge nurse, on-coming nurse, off-going nurse, and on-call urology resident. Nursing staff within the first or second year of independent practice, a charge nurse with varying years of experience, and postgraduate urology residents were selected on the basis of convenience of schedule. As the resident rotation changed, a new resident and nursing group participated in a training experience. The roles of simulation team members were also defined (see Table 2). The four members of the simulation team were the person doing the videotaping, the training scenario facilitator, the person whose voice was the patient's voice, and the facilitator of orientation and debriefing.

Simulation Implementation

Briefing. An unoccupied hospital room was set up by the unit safety team on the morning of the training. Equipment was available through the department of nursing, and delivery was arranged by a nurse education specialist (see Table 1). The in situ simulation experience began with a brief didactic session for all participants, discussion of TeamSTEPPS® teamwork principles, and completion of the teamwork rating scale. Participants were encouraged to practice the skills of leadership, situation monitoring, mutual support, and communication (AHRQ, 2008b) during the training scenario and were told that the training focus was on communication and teamwork skills. Participants were also informed that the events in the patient care room would be videotaped for educational and QI purposes. Orientation to the unoccupied patient care room, the low-fidelity training mannequin, the patient voice, the phone, use of the speaker setting, the resident pager number, and phone numbers to simulate a call for all other needs, such as the rapid response team and laboratories, were provided to participants. Calls made by the training participants were answered by the facilitator of briefing and debriefing on the portable phone. After room orientation, the RNs were given information about their assigned patient and as much time as they needed to read and review the patient's clinical information. After this briefing, the resident stayed on the hospital unit and was available by the physician service pager number.

Scenarios. The primary deteriorating patient situation concerned a case of evolving urosepsis after cystectomy. The secondary emergent experience was an unresponsive patient in cardiopulmonary arrest (see scenario in Table 3). The scenario started as two RNs conducted a change-of-shift bedside report in the patient room. Video recording began with bedside handoff. Members of the in situ simulation team followed and directed the scenario as needed. The simulation facilitator prompted status changes, such as vital signs that required nursing response, and communication with team members. Information was designed to initiate communication by the nurse with other nursing staff, to page the service, or to simulate a call to activate the rapid response team.

Debriefing. Participants returned to the unit conference room for debriefing of the training scenario led by the video recorder (see Table 4). During debriefing, the communication

Table 3.
Scenario Description

Scenario
At change of shift, the on-coming RN reviews patient plan of care. A 70-year-old man with a history of hypertension and hyperlipidemia and a diagnosis of bladder cancer had a cystoprostatectomy with neobladder formation five days ago. Most recent VS: temperature, 36.7° C; heart rate, 87 BPM; blood pressure, 115/76 mmHg; respiration rate, 16/min; oxygen saturation, 97% on room air. Weight, 83.5 kg, up 0.5 kg from admission. Laboratory tests: hemoglobin, 10.1 g/dL; hematocrit, 29.9%; RBC, 13.5´10^6/L; WBC, 6.8´10^9/L; sodium, 136 mEq/L; potassium, 3.5 mEq/L; bicarbonate, 20 mEq/L; creatinine, 1.1 mg/dL; BUN, 26 mg/dL. Medications: Lisinopril, heparin, acetaminophen, oxycodone, and simvastatin.
Nurse-to-Nurse Bedside Handoff
The patient reports feeling tired and chilled. The RN should assess patient's VS. The narrator provides the new set of VS: temperature, 39.0° C; heart rate, 72 BPM; blood pressure, 103/61 mmHg; MAP, 75 mmHg; respiration rate, 20/minute. The RN should page the physician and use SBAR to communicate the patient status. Acetaminophen is given, and blood for laboratory analysis is drawn as ordered by physician.
Ongoing Assessment
The narrator describes that an hour has passed. The RN should reassess VS. VS are temperature, 39.0° C; heart rate, 74 BPM; blood pressure, 99/55 mmHg; MAP, 70 mmHg; respiration rate, 28/minute; oxygen saturation, 76% on 4L/nasal cannula. Laboratory tests: hemoglobin, 9.5 g/dL; hematocrit, 27.6%; RBC, 13.6´10^6/L; WBC, 23.3´10^9/L; sodium, 134 mEq/L; potassium, 3.3 mEq/L; bicarbonate, 15 mEq/L; calcium, 4.71 mg/dL; creatinine, 1.8 mg/dL; BUN, 35 mg/dL. The patient begins to report dyspnea. The RN should ask for help, call the physician, and simulate a call to the RRT. The RN should use SBAR to communicate patient status. The simulated call from the RN to the RRT would be answered by the simulation facilitator carrying the portable phone. Scenario ends. The participants and scenario team members return to conference room for debriefing session. During the debriefing session, another staff member runs into the room yelling that a patient needs help and is on the bathroom floor. The RN and physician participants respond and find the mannequin slumped on the toilet and nonresponsive. Participants are instructed to respond as if the mannequin were a real person. A simulated call for a medical emergency is placed to the simulation facilitator. Participants must bring the reserved emergency equipment and initiate CPR. The scenario ends. The debriefing session resumes.

Notes: BPM = beats per minute; BUN = blood urea nitrogen; CPR = cardiopulmonary resuscitation; MAP = mean arterial pressure; RBC = red blood cell count; RN = registered nurse; RRT = rapid response team; SBAR = situation, background, assessment, and recommendation; VS = vital signs; WBC = white blood cell count.

strategies introduced in the short didactic session were discussed, and video clips were shown to highlight where the team performed well or areas that highlighted improvement opportunities. This process was designed to promote transparent thinking and team communication. Participants were encouraged to reflect on their experience, identify lessons learned, and give feedback for improved team performance. Most importantly, discussion centered on what team principles could be applied to patient care scenarios on the unit.

Results

Before and after the simulation experiences, participants were asked to conservatively rate the 16 qualities of team performance using the Mayo High Performance Teamwork Scale's three-point rating system: 0 = rare to never; 1 = inconsistent; and 2 = consistent (Malec et al., 2007).

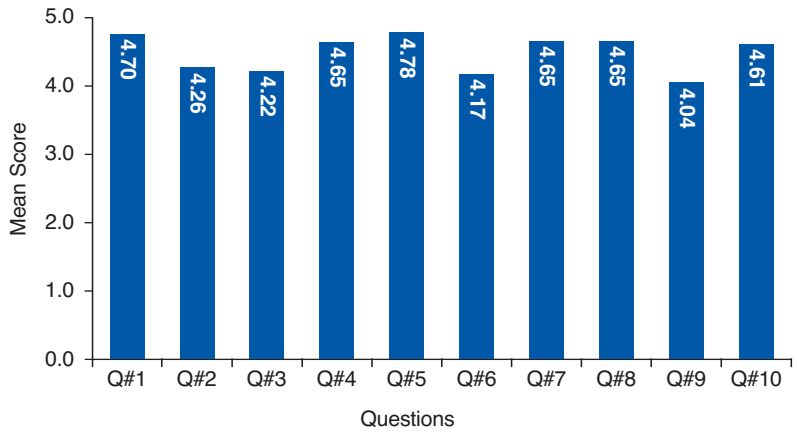
A total of 23 staff consisting of 18 RNs and five urology residents completed the QI project activities. Mean scores were calculated for each of the 16 items on the Mayo High Performance Teamwork Scale (Malec et al., 2007) and pre- and post-scores were compared. The mean score of the Mayo High Performance Teamwork Scale increased by 0.7 or greater for questions 5 (members verbally communicate their activities), 9 (situation awareness is maintained when conflicts are addressed), 12 (statements to avoid error or ask for clarification are accepted in a positive light), and 15 (team persists in obtaining a response to questions or concerns to avoid error). There was improvement in the mean scores of high-performance teamwork behaviors for the other questions except for questions 8 (active involvement by all team members), 10 (during an emergent event, roles are shifted as

Table 4.
Debriefing Discussion Points

• Did participants demonstrate correct use of SBAR communication structure in the handoff among team members?
• What teamwork principles and communication strategies were demonstrated by the RNs and urology resident (e.g., leadership, situation monitoring, mutual support, communication)?
• What principles and communication strategies could be improved?
• Feedback from the RNs and urology resident regarding what went well and what should be changed in future simulation scenarios.

Notes: RN = registered nurse; SBAR = situation, background, assessment, and recommendation.

Figure 1.
Training Evaluation



Q#1 Overall, this training was useful.
Q#2 This training prompted realistic responses from me.
Q#3 The patient scenario was realistic.
Q#4 The post-simulation debriefing enhanced my learning.
Q#5 It makes sense to use simulation training to discuss teamwork principles.
Q#6 This training improved my confidence with code situations.
Q#7 This training was effective for practicing SBAR handoff.
Q#8 This training was an effective way to introduce high-reliability teamwork behaviors and principles.
Q#9 This training increased my efficiency with location and application of emergency equipment.
Q#10 The spontaneous nature of this simulation training increased its effectiveness.

Note: SBAR = situation, background, assessment, and recommendation.

Legend
Figure 1. Simulation Training Evaluation Results. A score of 1 indicates strongly disagree; 2, disagree; 3, neutral; 4, agree; and 5, strongly agree. SBAR indicates situation, background, assessment, and recommendation.

necessary), and 11 (members asked for clarity of directions as needed) where the pre- and post-training mean scores were similar. These data suggested that the aims of this QI project were met. For aim #1, the in situ simulation training improved the interdisciplinary team performance of nurses and physicians in a training exercise of a simulated patient experiencing an acute status change and emergent condition. In regard to aim #3, the in situ simulation training provided a mechanism for nurses and urology residents to practice evidence-based communication skills.

In addition, after the simulation experience, participants were invited to complete the 10-question survey to assess their reactions to the in situ simulation experience. Mean score for all 10 questions in the post-ranking satisfaction survey ranged from 4.04 to 4.78 (on a scale of one to five) (see Figure 1). Each participant agreed or strongly agreed that the training was useful, the scenario was realistic, and the debriefing enhanced learning. In addition, 83% agreed or strongly agreed that the training prompted realistic responses, with 87% agreeing or strongly agreeing that the in situ experience improved their confidence in emergency code situations. All participants also agreed or strongly agreed that the training was effective for practicing handoffs using SBAR and believed the training's effectiveness was enhanced by the spontaneous nature of the scenario. These data suggested the quality improvement aim #2 was met. In situ simulation was feasibly implemented on an inpatient general surgical unit with interdisciplinary team membership and satisfactory participant reaction was achieved. Participants' comments included the following:

- "Builds confidence in our team, more trust that we can work well together. This was helpful as some principles of teamwork need to be recog-

nized from simulation – not just discussion."
- "It was great to have a physician involved to get an interdisciplinary view. Good for recognizing what you can do to help the team work more effectively."
- "[It was] great interacting with nursing staff. Clinical scenarios were realistic with real vitals, labs, etc."
- "Good to talk over scenarios and analyze critically."
- "[It was] great to watch the videos immediately."
- "Would be extremely useful for all nursing, resident, and allied staff."

Discussion

In situ simulation training experiences provided the interdisciplinary team the opportunity to practice the skills of high-performing teams and to reflect on and evaluate their own performance. The interdisciplinary team performance of nurses and urology residents was enhanced by responding to a simulated patient having an acute status change and emergent condition, as suggested by improved scores on the Mayo High Performance Teamwork Scale (Malec et al., 2007). The improvements in questioning and in speaking up during the training experience were encouraging because these actions create a shared mental model among team members, and therefore, are critical to enhancing patient safety. In situ simulation training was feasibly implemented with satisfactory trainee reaction on an inpatient general surgical unit with interdisciplinary team membership. The in situ simulation training served as a mechanism for practicing evidence-based communication skills among the nurses and residents.

The positive impact on team performance with one surgical specialty supports the value in expanding the in situ training experience to two other surgical specialties that have patients on the nursing unit. To improve the safety of patient care, nurse leaders must continually develop "cohesive, structured relationships within interdisciplinary teams" (Miller et al., 2009, p. 248). However, teams in health care lack stability of membership and consistent leadership; these observations represent major barriers to achieving highly reliable care (Miller et al., 2009). In addition, the dynamic nature of unit staffing creates endless possibilities for team composition on a daily basis. The present scenario design limits the number of participants to four in an effort to provide each an active role in the emergent situation. Because the scenarios are conducted once per change of resident rotation, it will take two or three years before all of the unit's nursing staff have the opportunity to participate.

The education strategy of in situ simulation training has been effective in building interdisciplinary teamwork and nursing staff confidence in managing emergency situations on our surgical unit.

The nature of in situ training increases the feasibility of replicating the training in an ongoing manner with other specialty groups. Training may be best implemented in small groups because the team can practice repetitively until its members observe that behaviors have become normalized in their work unit (Musson & Helmreich, 2004). Anecdotally, the safety team developed confidence and efficiency in facilitating the training over the course of the training cycles. They became comfortable with participating in the peer-to-peer human factors of teamwork and communication discussions, which further add value as they practice in the work unit when these situations unfold with real patients. The basic elements of the training could be used with scenario modifications according to differing clinical conditions. With respect to time required for the training, this in situ model ranged from 100 to 115 minutes. The unit's safety team will continue to use this format to improve communication and teamwork on the basis of the actual patient scenarios on the unit, with focus on applying learning prospectively to similar real clinical scenarios.

Summary

The education strategy of in situ simulation training has been effective in building interdisciplinary teamwork and nursing staff confidence in managing emergency situations on our surgical unit. The initial success has provided the evidence to support expanding the training to additional surgical specialty physicians on the nursing unit.

Simulation holds great promise for training individuals and teams of diverse health care professionals in the current workforce and in the workforce of the future. In health care environments, implementation of effective teamwork strategies requires that team training is not the sole element; however, it must be instituted interdependently with a fair and just culture and visible, engaged leadership (Frankel et al., 2006).

References

Agency for Healthcare Research and Quality (AHRQ). (2008a). *Using simulation in TeamSTEPPS® training: Classroom slides: Training guide.* Rockville, MD: Author. Retrieved from http://www.ahrq.gov/professionals/education/curriculum-tools/teamstepps/simulation/simulationslides/simslides.html#slide9.

Agency for Healthcare Research and Quality (AHRQ). (2008b). *TeamSTEPPS® pocket guide: Strategies & tools to enhance performance and patient safety.* Rockville, MD: Author.

Baker, D.P., Day, R., & Salas, E. (2006). Teamwork as an essential component of high-reliability organizations. *Health Services Research, 41*(4, Pt. 2), 1576-1598.

Burke, C.S., Salas, E., Wilson-Donnelly, K., & Priest, H. (2004). How to turn a team of experts into an expert medical team: Guidance from the aviation and military communities. *Quality & Safety in Health Care, 13*(Suppl. 1), i96-i104.

Frankel, A.S., Leonard, M.W., & Denham, C.R. (2006). Fair and just culture, team behavior, and leadership engagement: The tools to achieve high reliability. *Health Research and Educational Trust, 41*(4, Pt. 2), 1690-1709.

Gaba, D.M. (2004). The future vision of simulation in health care. *Quality & Safety in Health Care, 13*(Suppl. 1), i2-i10.

Greiner, A.C., & Knebel, E. (2003). *Health professions education: A bridge to quality*. Washington, DC: National Academies Press.

Guise, J.M., Lowe, N.K., Deering, S., Lewis, P.O., O'Haire, C., Irwin, L.K., … Kanki, B.G. (2010). Mobile in situ obstetric emergency simulation and teamwork training to improve maternal-fetal safety in hospitals. *Joint Commission Journal on Quality and Patient Safety, 36*(10), 443-453.

Hobgood, C., Sherwood, G., Frush, K., Hollar, D., Maynard, L., Foster, B., … Taekman, J; Interprofessional Patient Safety Education Collaborative. (2010). Teamwork training with nursing and medical students: Does the method matter? Results of an interinstitutional, interdisciplinary collaboration. *Quality & Safety in Health Care, 19*(6), e25. Epub 2010 Apr 27.

Institute for Healthcare Improvement (IHI). (2011). *Plan-Do-Study-Act (PDSA) worksheet*. Cambridge, MA: Author. Retrieved from http://www.ihi.org/knowledge/Pages/Tools/PlanDoStudyActWorksheet.aspx\.

Institute of Medicine (IOM). (2000). T*o err is human: Building a safer health system*. Washington, DC: National Academy Press.

Jacobson, T., Belcher, E., Sarr, B., Riutta, E., Ferrier, J.D., & Botten, M.A. (2010). Clinical scenarios: Enhancing the skill set of the nurse as a vigilant guardian. *The Journal of Continuing Education in Nursing, 41*(8), 347-353.

Klipfel, J.M., Gettman, M.T., Johnson, K.M., Olson, M.E., Derscheid, D.J., Maxson, P.M, … Vierstraete, H.T. (2011). Using high-fidelity simulation to develop nurse-physician teams. *Journal of Continuing Education in Nursing, 42*(8), 347-357. Epub 2011 Feb 8.

Leonard, M., Graham, S., & Bonacum, D. (2004). The human factor: The critical importance of effective teamwork and communication in providing safe care. *Quality & Safety in Healthcare, 13*(Suppl. 1), i85-i90.

Malec, J.F., Torsher, L.C., Dunn, W.F., Wiegman, D.A., Arnold, J.J., Brown, D.A., & Phatak, V. (2007). The Mayo High Performance Teamwork Scale: Reliability and validity for evaluating key crew resource management skills. *Simulation in Healthcare, 2*(1), 4-10.

Miller, K., Riley, W., & Davis, S. (2009). Identifying key nursing and team behaviours to achieve high reliability. *Journal of Nursing Management, 17*(2), 247-255.

Musson, D.M., & Helmreich, R.L. (2004). Team training and resource management in health care: Current issues and future directions. *Harvard Health Policy Review, 5*(1), 25-35.

Patterson, M.D., Geis, G.L., Falcone, R.A., LeMaster, T., & Wears, R.L. (2013). In situ simulation: Detection of safety threats and teamwork training in a high-risk emergency department. *British Medical Journal Quality Safety, 22*(6), 468-477. Epub 2012 Dec 20.

Roberts, K.H., Yu, K., & van Stralen, D. (2004). Patient safety is an organizational systems issue: Lessons from a variety of industries. In B. Youngberg, & M. Hatlie (Eds.), *The patient safety handbook* (pp. 169-86). Sudbury, MA: Jones and Bartlett.

Rosen, M.A., Hunt, E.A., Pronovost, P.J., Federowicz, M.A., & Weaver, S.J. (2012). In situ simulation in continuing education for the health care professions: A systematic review. *Journal of Continuing Education Health Professions, 32*(4), 243-254.

Sammer, C.E., Lykens, K., Singh, K.P., Mains, D.A., & Lackan, N.A. (2010). What is patient safety culture? A review of the literature. *Journal of Nursing Scholarship, 42*(2), 156-165.

Schiavo, R. (2007). *Health communication: From theory to practice*. San Francisco: Jossey-Bass.

Weaver, A. (2011). High-fidelity patient simulation in nursing education: An integrative review. *Nursing Education Perspectives, 32*(1), 37-40.

Ziv, S.D., Small, P.R., & Wolpe, A. (2000). Patient safety and simulation-based medical education. *Medical Teacher, 22*(5), 489-495.

Instructions For Continuing Nursing Education Contact Hours

Patient Safety Improvement Through In Situ Simulation Interdisciplinary Team Training

Deadline for Submission: February 29, 2016

UNJ 1402

To Obtain CNE Contact Hours

1. For those wishing to obtain CNE contact hours, you must read the article and complete the evaluation through **SUNA's Online Library.** Complete your evaluation online and print your CNE certificate immediately, or later. Simply go to **www.prolibraries.com/suna**
2. Evaluations must be completed **online** by February 29, 2016. Upon completion of the evaluation, a certificate for 1.3 contact hour(s) may be printed.

Fees – *SUNA Member:* $15 *Regular:* $15

Objectives

This continuing nursing education (CNE) activity is designed for nurses and other health care professionals who care for and educate patients and their families regarding patient safety improvement through in situ simulation interdisciplinary team training. For those wising to obtain CNE credit, an evaluation follows (online). After studying the information presented in this article, the nurse will be able to:

1. Discuss the importance of interdisciplinary teamwork in the clinical setting.
2. Describe the impact in situ training for emergency situations may have on RNs' and urology residents' perceptions of team performance.

Note: *Christine Bradway, PhD, CRNP, FAAN, disclosed that she is a Consultant for Direct Supply, Inc. All other Editorial Board members, as well as the Editor, author, and Education Director, reported no actual or potential conflict of interest in relation to this continuing nursing education article.*

This activity has been provided by the Society of Urologic Nurses and Associates (SUNA).

Society of Urologic Nurses and Associates is accredited as a provider of continuing nursing education by the American Nurses Credentialing Center's Commission on Accreditation.

SUNA is a provider approved by the California Board of Registered Nursing, provider number CEP 05556. Licensees in the state of CA must retain this certificate for four years after the CNE activity is completed.

This article was reviewed and formatted for contact hour credit by Rosemarie Marmion, MSN, RN-BC, NE-BC, SUNA Education Director; and Jane Hokanson Hawks, PhD, RN-BC, FAAN, Editor.