Medical Simulation: The Missing Link in Achieving Safer, More Cost-Effective Care

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Medical simulation is an educational strategy in which a particular set of conditions is created or replicated to resemble authentic situations that are possible in real life. In this commentary we discuss how simulation is used and how it can reduce medical error, improve teamwork and communication, and improve trust in the health care system.

Background

You are standing at the door of a conference room. On the other side of that door, a family is waiting for you to update them on the status of a loved one whose care required the placing of a central venous line. Unfortunately, during the procedure to place this line, the lung was punctured, and the patient had to have a chest tube placed to evacuate the resulting pneumothorax. As a result, their loved one has suffered a significant setback and will now have an extended stay in the hospital. As the treating provider, you must explain the complication to the family. You realize that you've not had to have a conversation like this in months, and as you enter the room, you forget the patient's name. Despite your explanations, the family continues to ask questions that clearly communicate a lack of understanding, such as, "What is a chest tube? What is a pneumothorax?" You continue to try to explain, but despite multiple attempts at clarification, frustrations build and the conversation ends with an unclear path forward.

When you return the next day, the family is angry, accusing the team of attempting to conceal errors that have occurred and failing to disclose the air between the lung and chest wall. Any attempts to move the course of treatment forward are frustrated by their constant refusal to consent to additional therapies as they continue to deny that they were ever told about complications or treatments. The patient makes a remarkable and full recovery, leaves the hospital without long-term sequelae, and resumes a normal life post-hospitalization. However, the family remains angry. They accuse the hospital of "hiding" mistakes under complicated language and remain adamant that the hospital and medical team are colluding to cover up everything that happened.

These scenarios present themselves in medicine every day, and the response from health care professionals is at times one of defense and justification: "We did a great job saving this person's life;" "The patient went home without any long-term effects;" "We work too hard with too little." All those statements are true. However, what these statements fail to acknowledge is that the development of a trusting and respectful patient-provider relationships is as much about how a therapeutic plan or procedure is communicated as it is about the competent execution of said plan or procedure. Both procedural and communication errors are medical errors with equally significant consequences with respect to the patient-provider relationship.

How can damage to this relationship be avoided? Just as the deliberate practice of a procedure can lead to proficiency in the execution of a technical skill, such as central line placement, similarly missteps in communication about health procedures and outcomes can be avoided with practice. There are many points of communication in the health care setting: between team and patient, team and family, and professional-to-professional. A misstep in any one of these interactions can lead to lasting damage to the foundation of trust that is critical to the patient-physician relationship. As such, this area deserves more attention and focus.

Defining the Problem

The Joint Commission has identified communication as one of the top causes of a sentinel event—a patient safety event that results in death, permanent harm, or severe temporary harm [1]. The miscommunication can occur in a variety of steps throughout the process of delivering care. Any miscommunication that leads to a medical error—defined as the failure of a planned action to be completed as intended or the use of a wrong plan to achieve an aim [2]—risks not only physical and psychological harm to the patient but also damage to the trusting relationship necessary for the effective delivery of care. In the United States alone, medical error accounts for nearly 100,000 preventable deaths each year [3]. The other top two causes of sentinel events—human factors (how clinicians interact with the health care system and patients) and leadership (how leaders create a safe environment in which to practice)—also both involve

Electronically published May 1, 2023.

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N C Med J. 2023;84(3):177-181. 0029-2559/2023/84314

failures of communication.

Communication challenges are not unique to the American health care system. The World Health Organization (WHO) has attempted to address this challenge on a global basis by teaching improved communication among health care providers and patients [2]. The WHO's *Patient Safety Curriculum Guide* references the Australian Patient Safety Education Framework, first published in 2004, in which communicating effectively is one of the seven learning areas; it also cites the 2009 Canadian Patient Safety Institute's *Safety Competencies*, in which communication is prominent in five out of six domains [2]. In this international guide, the use of simulation is highlighted as an evidence-based way of successfully delivering communication training.

This highlights the fundamental role that communication plays in the delivery of safe, effective health care. It also recognizes the benefit of practice and simulation to ensuring that communication with families about medical error or about difficult news (e.g., that a patient has cancer or is dying) is seamless and clear. Simulation can also help clinicians practice scenarios in which patients or their loved ones have misunderstandings about common medical terms, such as when a physician says a patient is "stable." Once one begins to understand that communication breakdowns or miscommunications are as significant as procedural missteps, one can begin to appreciate the importance of the incorporation of simulation into the practice of medicine as a way to improve the foundation of trust in the health care system [4].

While many specialties have developed procedural simulations, we fail to universally recognize the importance of practicing the elements of our craft that involve communication. This is despite the fact that medical simulation involving communication has demonstrated many benefits to patients and staff: it improves patient safety by reducing medical errors, enhances teamwork and communication among teams, allows cost savings through the reduction of medical errors, allows the ability to tailor the training experience to the level(s) of the learner, and improves quality of care delivered by the health care team, increasing trust [5, 6].

Why Simulate?

Health care (medical) simulation can incorporate one or more modalities to promote, improve, or validate a participant's performance as they experience an authentic replication of a real-life situation they may encounter [7]. Many proponents highlight that health care simulation provides a safe, supportive educational environment [5]; others promote its ability to tailor high-risk scenarios for all levels of learners, allowing for acquisition of skills via realistic training without risking harm to patients [8]. Reasons to use simulation can also be rooted in adult learning principles (Table 1). Active engagement of adult learners, enhancing their prior knowledge and experiences, and recognizing their diversity are the building blocks of a successful medical simulation program. By incorporating these adult learning principles, high-fidelity medical simulation creates an adaptive, flexible environment that actively engages the adult learner, creating a safe, realistic environment that allows for individualized learning, repetitive practice, a variable degree of difficulty, and the opportunity to receive feedback and hone skills (Table 2). This is especially important in communication, where there are few opportunities to repeat an encounter to get it right.

TABLE 1.
Five Adult Learning Principles That Apply to the Medical Learner

1. Adult learners need to know why they are learning.
2. Adult learners are motivated by the need to solve problems.
3. The previous experiences of adult learners must be respected and built upon.
4. The educational approach should match the diversity and background of adult learners.
5. Adults need to be actively involved in the process.

Source. Okuda Y, Bryson EO, DeMaria S, et al. The utility of simulation in medical education: what is the evidence? *Mt Sinai J Med.* 2009;76(4):330–343. doi: 10.1002/msj.20127

This strategy is not new. Indeed, it can trace its origins as far back as ancient Egyptian descriptions of the use of wax and clay models in a variety of operative settings [9]. Modern health care simulation had its origins in the early 1960s with the development of the Resusci-Anne mannequin, which was used as a tool for teaching the then-new practice of mouth-to-mouth breathing, the initial steps of cardiopulmonary resuscitation (CPR) [10]. In the 1980s, the high-fidelity simulation movement (one focused on using more lifelike mannequins in realistic conditions) gained broader acceptance through efforts at Stanford University [8]. Today, simulation has taken on a variety of different forms, including mannequin-based training, virtual reality- or artificial reality-based training, and training involving the use of live actors, or "standardized patients" (SPs), in order to simulate live patient encounters or interviews. All of

TABLE 2.
Features and Uses of High-Fidelity Medical Simulations That Lead to Effective Learning

1. Mechanism for repetitive practice
2. Ability to integrate into a curriculum
3. Ability to alter the degree of difficulty
4. Ability to capture clinical variation
5. Ability to practice in a controlled environment
6. Individualized active learning
7. Adaptability to multiple learning strategies
8. Existence of tangible/measurable outcomes
9. Use of intra-experience feedback
10. Validity of simulation as an approximation of clinical practice

Source. Okuda Y, Bryson EO, DeMaria S, et al. The utility of simulation in medical education: what is the evidence? *Mt Sinai J Med.* 2009;76(4):330–343. doi: 10.1002/msj.20127

SIDEBAR

PAs are Trusted Partners in Clinical Care

Lisa P. Shock

Physician assistants (or associates [1]) (PAs) are integral team members who are essential to clinical delivery in many settings. Interprofessional team-based care has evolved and had a positive impact on practice performance as well as health outcomes, while encouraging the development of trust within the provider-patient relationship [2]. Evidence shows that including PAs on interdisciplinary teams increases access to care, reduces health care costs, and improves outcomes [3], none of which would be possible without a strong foundation of trust between provider and patient.

The American Academy of Physician Assistants and the Physician Assistant Education Association published a joint statement on required competencies for the PA profession. Within a PA training program, training on interpersonal and communication skills is required and professional competencies include, "the effective and appropriate application of medical knowledge, interpersonal and communication skills, patient care, professionalism, practice-based learning and improvement, and systems-based practice" [4].

The nonprofit Primary Care Collaborative (PCC) promotes a transformation of the health care delivery system that is built on a strong foundation of primary care using a medical home model. The PCC model promotes an interdisciplinary team approach that includes PAs focused on patient engagement and trust. This model is patient-centered, coordinated, accessible, and committed to quality and safety [5]. In order for patients and families to manage and organize their care and fully participate in shared decision-making, there must be a focus on strong and trusted relationships with the care team and open communication regarding health status.

Communication is central to building trust and supporting patient satisfaction. PAs are especially skilled at patient-centered communication; PA practice reflects a deep commitment to interpersonal communication skills that address verbal, nonverbal, written, and electronic communication [4]. This dedication and emphasis on communication skills results in increased patient activation and has led to the development of evidence-based Patient Activation Measures [6]. The concept of patient activation offers clinicians a unique opportunity to assess and understand an individual patient's ability to engage with their health care team, develop a greater understanding of chronic health conditions, and therefore have informed decision-making for future treatment. Patients seeking health care services must not only to engage with a team of health professionals but also have the capacity and willingness to follow instructions immediately after treatment or a stay in hospital, and/or to come in for preventive wellness care [6]. Some health care providers may have an overly optimistic view of their patients' ability to actively participate in their care; some have developed a number of ways of tailoring care delivery according to a patient's level of activation. Examples of enhanced resourcing and communication tailored to patient activation may include allocating or tailoring resources to particular patient groups, adjusting the speed of access to and/or frequency of contact with the health care team, and maximizing the value of primary care and specialty appointments for less-activated, less-engaged patients [6].

Interprofessional communication tailored to patient need and readiness is a core competency for developing trust, which is critical. Effective exchange of health information has been shown to encourage and promote patient engagement in decision-making and promote clinician response to patients' emotions when discussing treatment [7]. PAs are trained as skilled communicators, adept at

these modalities present opportunities to practice communication. For simulations involving skill development (e.g., surgical skills), one could incorporate practice in providing informed consent and explaining what the patient should expect, tailored to a variety of levels of patients' health literacy and enthusiasm for the procedure. In a study conducted by the American College of Surgeons, patients rated surgeons who had undergone simulation-based training significantly higher in terms of communication, professionalism, and overall satisfaction compared to those who had not undergone simulation training [11].

Simulations involving an emergency, such as a cardiac arrest, often focus on communication among team members. This communication is critical, but often, the equally important aspect of communication with families is left unaddressed. This is important because several issues and questions arise for family and other loved ones during resuscitation. How do we communicate when a resuscitation must be discontinued, or that our resuscitative efforts have failed to generate the return of a heartbeat? How do we explain the notion that, while a heartbeat has returned, there was significant brain (or other organ) damage, and how does the team communicate the implications of "significant end-organ injury" in terms that families understand? Does the conversation differ when the recipient of the information has a health care background, a college degree, or very little health

connection and building patient relationships. PAs are also knowledgeable about how best to address patient hesitancy and concerns that can lead to doubt and challenges in accessing needed clinical services for chronic disease management. Patient-centered discussion and facilitation of information exchange, often used by PAs, can generate trust and assist with developing a strong clinician-patient relationship [6]. Empathetic communication also seems to support more accurate information-gathering by clinicians, eliciting clarity of information provision and therefore enhancement of patient trust [7].

Advocacy must continue to support team-based care and adequate training to ensure that new clinicians are communicating effectively with patients and building positive trust. The Joint Commission has made significant efforts to better understand individual patients' needs and to provide guidance for health care organizations working to address those needs [8]. Initially, the Joint Commission focused on studying language, culture, and health literacy issues, but later expanded its scope of work and training materials to include the broader issues of effective communication, cultural competence, and patient- and family-centered care [8]. No longer considered to be simply a patient's right, effective clinician-patient communication is now accepted as an essential component of quality care and patient safety [8].

Patients are far more likely to trust PAs and health care professionals who are open and honest in their approach, admit to errors, apologize when necessary, and do everything in their power to rectify any mistake [9]. PAs, like many other licensed professionals on the interdisciplinary care team, must meet standards of safe practice and continuous education throughout their careers. Continued professional development and ongoing refinement of skills needed for effective communication remain priorities for high-performing PAs and all members of interdisciplinary care delivery teams. NCMJ

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Acknowledgments

The author's title at UnitedHealthcare is Chief Population Health Officer, Managed Medicaid Plan of NC. All opinions stated within this work are the author's own and this work is an independent work product, done outside of her regular job responsibilities.

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Electronically published May 1, 2023.

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N C Med J. 2023;84(3):179-180. 0029-2559/2023/84315

literacy? How does one assess level of understanding? All of us recognize that getting it right the first time is important. It is harder to do that if we've never encountered a particular situation in the past. Simulation provides the opportunity to practice both routine scenarios and ones that may be more rare. It is in those moments of safe, supported practice that we can receive instant feedback on the success of our communication without long-term consequence to a patient or family member, leading to improved communication and stronger relationships with future patients and their families.

Next Steps

The challenges facing health care in the wake of the global COVID-19 pandemic are monumental: limited staffing, reports of significant medical errors and complications occurring in health care settings, a growing sense of burnout among providers, frustrations of patients resulting in increasing episodes of workplace violence, and increasing financial pressures. Individually, any one of these factors could create significant challenges for a health care institution.

One could look at the airline industry as a reflection of the direction health care could take; just as the airline industry turned to crew resource management (CRM) training to improve teamwork, communication, and safety culture after a series of high-profile disasters in the 1970s, health care could establish a similar structure as standard practice

[12, 13]. By regulating the recertification and skills-maintenance process at a central level, including the incorporation of communication practice and training, public trust and faith in the health care system could be improved just as it was in aviation [14]. NCMJ

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Acknowledgments

Disclosure of interests. Dr. Joyner is a volunteer for the American Heart Association and co-chairs the Pediatric Basic Life Support Guidelines Writing Committee. No further interests were disclosed.

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