Chapter

Introductory Chapter: Patient Safety Remains an Elusive, Fast-Moving Target

Philip N. Salen and Stanislaw P. Stawicki

1. Introduction

Among the most important aspects when creating, developing, and overseeing healthcare facilities and systems are patient and staff safety [1]. The publication of The Institute of Medicine's *To Err is Human* more than 2 decades ago brought much-needed attention to the issue of patient safety in the United States and worldwide by exposing the previously underappreciated impact of medical errors on patient outcomes and illuminating the potential benefits of enhancing safety as an essential core value by US medical practitioners and within US health care institutions [2, 3]. The report endorsed several important agenda items, most notably: errors occur frequently, they have clinical and financial impact, systems-related pitfalls amplify miscues, and preclusion of errors will enhance patient safety [2].

The underappreciation of the patient safety issue can be clearly seen when examining the original report [2]. The Institute of Medicine (now called the National Academy of Medicine) reported that medical errors resulted in between 44,000 and 98,000 potentially avoidable deaths annually in the US alone, which provided additional impetus to a heightened focus on patient safety both in the US and internationally [2, 3]. To give a real-life perspective, the above range of patient safety-event-attributable mortalities is equivalent roughly to an entire population of a small city, and consistently so, year after year.

The Agency for Healthcare Research and Quality (AHRQ) has promoted patient and public safety by encouraging patient safety research during this time in part by focusing on the delineation of error, hospital accreditation, and healthcare directives [2, 4]. Healthcare leadership both institutionally and clinically has focused on patient safety as a metric, utilizing objective scorecards and pay for performance measures [5, 6]. In the context of this chapter, the definition of the phrase "culture of safety" refers to the sum of individual and group ethos, conducts, behaviors, capabilities, and patterns of practice that reflect the adherence to professional and organizational safe practice standards [7].

The primary intent of this textbook, *Contemporary Issues in Patient Safety Volume 2,* is to present a wide-ranging discussion of various, essential patient safety principles and practices to enhance current patterns and to help create patient safety algorithms, systems, and symbioses necessary for the required advancements in clinical outcomes related to patient and staff safety [8].

2. Challenges of evolving healthcare system complexity

Over the last 20 years, significant progress across our healthcare systems has been made when it comes to clinical knowledge, scientific research, and technological advances. Modern technologies have the potential to play an important role in enhancing patient safety via improving hospital algorithms and methodologies for prevention of patient safety adverse events, such as central venous catheter infections, ventilator-associated infections, surgical site infections, and nosocomial urinary tract infections [9, 10]. The medical literature demonstrates that healthcare errors and detrimental events appear to be associated with the ever increasing complexity of medical care as well as poorly optimized workflows [10]. With escalating focus on the centrality of the patient as the core constituent in the clinical safety arena, promoting salubrious practices while eliminating deleterious patterns of expanding healthcare complexity have the potential to facilitate patient safety [8].

Novel implementations of advances in medical knowledge, new medical techniques, and innovative devices empower physicians to provide better, more effective care. However, this sometimes comes at the cost of greater complexity of care. In the process, new contemporaneous challenges may emerge, including the necessity to constantly keep abreast of the latest medical scientific discoveries and devices, further incorporate the ever-expanding role of electronic health records (EHR), and integrate a myriad of new parameters into daily clinical practice, perhaps without fully considering the effects of information overload on the ability to effectively process critical information [11, 12]. Among the unforeseen consequences of this tremendous systemic growth and development is the appearance of situational circumstances that are nearly impossible for a single individual to comprehend, analyze, and act upon. In response to the impact of the rapid increase of complexity of technology on patient safety, many potential solutions have focused on team-based approaches as a foundational value of modern patient-safety approaches [13, 14].

The institutional practice climate has gradually evolved toward a framework that encourages teamwork via emphasis on better communication skills, professionalism, and communal respect among all the clinical and nonclinical care providers [15]. The relationship between patient-safety culture and teamwork has been studied quite extensively in the most complex of hospital environments, critical care units, and other clinical environments to help determine if this relationship improves patient outcomes and impacts staff satisfaction (and safety) [7]. Although differences exist between critical care units in terms of housestaff training versus no housestaff, private versus public, closed versus open "workflow architecture," intensivist versus non-intensivist staffed, and cardiac versus surgical versus neurological versus medical units, team-based approaches within these units have both enhanced perceptions of safety and correlated with beneficial clinical outcomes, staff satisfaction, and staff retention [7, 13].

3. Focus on data quality and high-fidelity event reporting

Among the most crucial issues in patient and staff safety today is the necessity for accurate and non-judgmental reporting (and subsequent discussion) of patient and staff safety events and incidents [6]. While many systems exist for reporting safety incidents, medical errors often go unreported or underreported [16]. A major challenge to accurate reporting of safety miscues is the vulnerability of the so-called

"cognitive reality" toward bias and error [17]. Poor or incomplete understating of patient safety issues results in more inaccurate and less relevant epidemiological information available to medical group practices and healthcare organizations, thus hindering key efforts to reduce potential and actual harm to patients [16]. There are multiple barriers to reporting safety incidents, at individual, team, and systemic levels. More specifically, among opportunities to improve safety incident reporting, clinicians note that insufficient feedback to the reporter and anxiety related to reporting occur quite commonly and correspond with low participation rates and less reliable safety data. Notably, physicians are less likely than nurses to document safety incidents [16].

Ex se intellegitur, the accuracy of any reported data will depend heavily on a variety of factors, including the reporting environment and the way any such reporting is handled at the organizational level. The ability to effectively demonstrate and reassure that non-punitive, constructive approaches to addressing patient safety events are hardwired into the organizational fabric is of critical importance. Indeed, this philosophy of dealing with patient adverse event reporting and root cause analysis is known to result in the best overall outcomes and system-wide improvements [15]. Highly structured approaches that incorporate constructive and synergistic learning are required, with recognition of the fact that a vast majority of medical errors have multiple "contributory inputs" and very rarely can be attributed to a single individual and/or action [18]. It is also critical to acknowledge that rigidly hierarchical systems (e.g., top-down command and control environments) will inherently have more potential failure modes than more horizontal systems (e.g., matrix-like partnerships with equally weighted stakeholder inputs) [19].

4. Enhancing safety through role models, teamwork, and leadership

Critical to the successful implementation of such self-learning and self-improving systems is the introduction of patient safety champions or individuals who actively promote patient safety within and across the organizational fabric [8]. These patient safety champions constitute a group of essential role models for other clinicians to emulate and provide sage insight into enhancing patient safety throughout healthcare organizations. The utilization of quality improvement measures directed at promoting the culture of safety and teamwork, for example in decreasing nosocomial hospital acquired infections, has resulted in improved patient care and non-trivial cost reductions [20]. In response to the constantly increasing complexity of healthcare in both inpatient and outpatient arenas, enhancing medical teamwork can improve patient safety and care by offering varying sources of input and knowledge to resolve complex safety issues, make prudent decisions, and complete tasks more productively and efficaciously [21]. Working in concert with patient safety champions, healthcare network's leadership must promote favorable patient safety practices, thereby promoting a well-integrated and comprehensive system of patient safeguards [6]. Properly organized, effective health system leadership necessitates that at every level of medical care delivery (unit, division, department, hospital, and health system), an organizational framework for safety and practice-based improvement exists that interacts effectively and efficiently across the entire matrix of care [11]. Pay-for-performance, a payment model that links quality of care with a corresponding level of payment for healthcare services, reinforces the patient safety role model in that the best performing clinicians will be more fully recognized for better, safer individual (and thus group) outcomes [22] **Figure 1**.

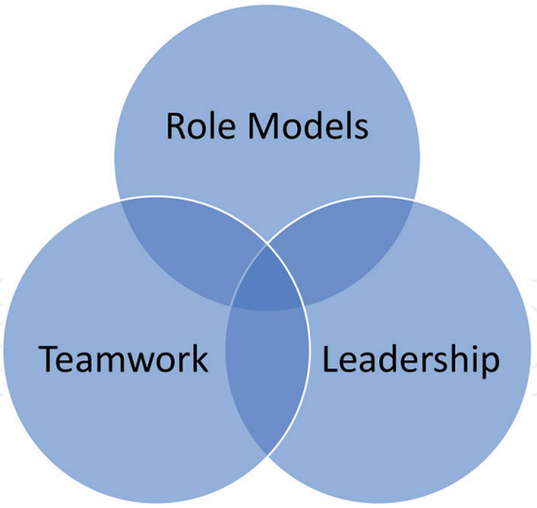

Figure 1.
Improving patient safety via role models, teamwork, and leadership.

5. Enhancing safety via utilization of the electronic medical record, medication ordering algorithms, and artificial intelligence

Health systems with built-in mechanisms for system-wide learning and improvement tend to perform better in general and especially so in the area of patient safety [23]. The Wired for Health Care Quality Act of 2005 appropriated funding in the US to promote adoption of medical information technology to enhance patient safety and improve quality of care [10]. As a consequence, healthcare networks have committed billions of dollars into the adoption of EHR systems, supposing that these systems would transform the incorporation of science-based practices into medical care, thereby resulting in better, safer care at reduced costs [12]. Highly effective and safe healthcare institutions promote and operate safely in multifaceted clinical milieus despite inherently complicated procedures and the potential for error [19]. The implementation of EHR has enhanced communication between providers systemically throughout the healthcare network and between the different specialties while limiting diagnostic errors through utilization of artificial intelligence algorithms [8]. Ongoing plans to maximize medical information technology as a method to incorporate the best science into the clinical arena incorporates decision-making guidance adjuncts, such as specialized disease order sets, documentation guidelines, and best practice algorithms [12].

6. Synthesis and conclusion

The evolution of best performing healthcare systems relies on all the essential elements presented in this textbook, including patient safety education, team-based approaches, accurate safety data collection and processing, the development of patient safety champions, as well as non-judgmental, self-learning, and self-correcting systems. Despite significant improvements during the past two decades, the achievement of sustained zero-defect patient safety performance continues to be as elusive as ever. With increasingly complex healthcare systems, where information and technology tend to evolve faster than an average clinician-stakeholder's ability to

DOI: http://dx.doi.org/10.5772/intechopen.109511

"absorb and adjust," our hopes for perfect safety record have become replaced with the realization that the Reason's "Swiss cheese" model applies to complex systems as much as it does to relatively simpler situations and events. Our quest continues toward better, safer healthcare systems. It is a life-long quest that increasingly takes on a form of self-discovering, continually improving organizations, rather than a "once-and-done" achievement of the ever-elusive perfection.

Author details

Philip N. Salen[1*] and Stanislaw P. Stawicki[2]

1 Department of Emergency Medicine, St. Luke's University Health Network, Bethlehem, Pennsylvania, USA

2 Department of Research and Innovation, St. Luke's University Health Network, Bethlehem, Pennsylvania, USA

*Address all correspondence to: philipsalen@gmail.com

IntechOpen

References

[1] Green A, Stawicki SP, Firstenberg MS. Introductory chapter: Medical error and associated harm-the critical role of team communication and coordination. In: Firstenberg M, Stawicki SP, editors. Vignettes in Patient Safety. Vol. 3. London, UK: IntechOpen; 2018. pp. 1-14

[2] Bates DW, Singh H. Two decades since to err is human: An assessment of progress and emerging priorities in patient safety. Health Affairs. 2018;**37**(11):1736-1743

[3] Institute of Medicine, Institute of Medicine, Board on Health Care Services, et al. Committe on data standards for patient safety. In: Board on Health Care Services. Patient Safety: Achieving a New Standard for Care. National Academies Press; 2004

[4] Meyer GS, Battles J, Hart JC, Tang N. The US agency for healthcare research and quality's activities in patient safety research. International Journal for Quality in Health Care. 2003;**15**(Suppl. 1):i25-i30

[5] McFadden KL, Henagan SC, Gowen CR. The patient safety chain: Transformational leadership's effect on patient safety culture, initiatives, and outcomes. Journal of Operations Management. 2009;**27**(5):390-404

[6] Green A, Stawicki SP, Firstenberg MS. Introductory chapter: Medical error and associated harm vignettes in patient safety. In: Firstenberg MS, Stawicki SP, editors. Vignettes in Patient Safety. Vol. 3. London, UK: IntechOpen; 2014. pp. 65-72

[7] Dunstan E, Cook JL, Coyer F. Safety culture in intensive care internationally and in Australia: A narrative review of the literature. Australian Critical Care. 2019;**32**(6):524-539

[8] Tolentino JC, Martins N, Sweeney J, Marchionni C, Valenza P, McGinely TC, et al. Introductory chapter: Developing patient safety champions. In: Stawicki SP, Firstenberg MS, editors. Vignettes in Patient Safety. Vol. 2. London, UK: IntechOpen; 2018. pp. 1-23

[9] Middleton B, Bloomrosen M, Dente MA, et al. Enhancing patient safety and quality of care by improving the usability of electronic health record systems: Recommendations from AMIA. Journal of the American Medical Informatics Association. 2013;**20**(e1):e2-e8

[10] Harrison JP, Daly MA. Leveraging health information technology to improve patient safety. Public Administration and Management. 2009;**14**(1):218-237

[11] Pronovost PJ, Mathews SC, Chute CG, Rosen A. Creating a purpose-driven learning and improving health system: The Johns Hopkins medicine quality and safety experience. Learning Health Systems. 2017;**1**(1):e10018. DOI: 10.1002/lrh2.10018

[12] Genies MC, Biondi EA, Berenholtz SM. Leveraging health information technology in the quest to improve health care value. Quality Management in Health Care. 2019;**28**(1):63-64

[13] Taylor N, Zighelboim I, Sholevar F, Stawicki SP, Firstenberg MS. Introductory chapter: Teams in healthcare-a voyage from 'Nice to have' to "the way to go.". In: Firstenberg M, Stawicki S, editors. Teamwork in Healthcare. London, UK: IntechOpen; 2021

[14] Stawicki SP, Cook CH, Anderson III HL, et al. Natural history of retained surgical items supports the need for team training, early recognition, and prompt retrieval. The American Journal of Surgery. 2014;**208**(1):65-72. DOI: 10.1016/j.amjsurg.2013.09.029

[15] Stawicki SP, Firstenberg MS. Introductory chapter: The decades long quest continues toward better, safer healthcare systems. In: Firstenberg MS, Stawicki SP, eds. Vignettes in Patient Safety. London, UK: IntechOpen; 2017:1-14

[16] Noble DJ, Pronovost PJ. Underreporting of patient safety incidents reduces health care's ability to quantify and accurately measure harm reduction. Journal of Patient Safety. 2010;**6**(4):247-250

[17] Croskerry P. The importance of cognitive errors in diagnosis and strategies to minimize them. Academic Medicine. 2003;**78**(8):775-780

[18] Holmström AR. Learning from Medication Errors in healthcare: How to make medication error reporting systems work? Helsingin yliopisto; 2017. Accessed October 9, 2022. Available from: https://helda.helsinki.fi/handle/10138/179230

[19] Portner M, Fumanti BJ, Bendas C, Cipolla J. Learning from others: Examples from air transportation and industrial realms. In: Stawicki SP, editor. Fundamentals of Patient Safety in Medicine and Surgery. Vol. 1. Wolters Kluwer Health (India) Pvt. Ltd; January1 2015. pp. 89-98

[20] Jain M, Miller L, Belt D, King D, Berwick DM. Decline in ICU adverse events, nosocomial infections and cost through a quality improvement initiative focusing on teamwork and culture change. Quality & Safety in Health Care. 2006;**15**(4):235-239

[21] Mayo AT, Woolley AW. Teamwork in health care: Maximizing collective intelligence via inclusive collaboration and open communication. AMA Journal of Ethics. 2016;**18**(9):933-940

[22] Corrigan K, Ryan RH. New reimbursement models reward clinical excellence: Pay-for-performance means that quality and revenue are no longer separate issues for healthcare providers. Healthcare Financial Management. 2004;**58**:88+

[23] Hollnagel E. Braithwaite J. Resilient Health Care: CRC Press; 2019