

Actionable Patient Safety Solutions (APSS) #17:
Patient safety curriculum



Patient Safety
MOVEMENT

APSS #17: Patient safety curricular resource

Welcome

Welcome to the Patient Safety Movement Foundation (PSMF) curricular resource. It is our mission to provide curricular materials that are **adaptable** to clinical learners across professional development, **applicable** across healthcare professions, emphasizing the benefits of team-based care and **highlighting** patient and family voices in the healthcare experience. By doing so, we strive to support development of the knowledge, skills, attitude, and behaviors needed to prepare healthcare providers to join the movement to improve patient safety and eliminate preventable medical error.

Why use it?

Dramatic advances in medical care, specialization, pharmacotherapeutics, and technology have benefited our patients, but also added complexity to care that increases risk of medical error and potential harm. The National Academy of Medicine's (formerly the Institute of Medicine) 1999 "To Err is Human: Building a Safer Health System" reported a shocking estimate of 44,000-98,000 deaths annually due to preventable errors in care. A 2013 study using the Institute for Healthcare Improvement's (IHI) Global Trigger Tool estimates an unimaginable 210,000 to 400,000 annual deaths due to error. A British Medical Journal publication in 2016 reported medical error to be the third leading cause of death in the U.S. National efforts to reduce medical error have stimulated growth of a new field of study: patient safety.

Thank you for your interest in our resource and stepping up to facilitate change. Does your educational program prepare clinicians with a foundation in patient safety knowledge, skills, and attitudes necessary to provide safe care? This cost-effective, practical approach to patient safety utilizes typical clinical settings and experiences that are readily available to your facilitators and learners.

Goals

Participants in this curriculum will:

- Develop improved knowledge of the science, as well as the human side, of patient safety
- Gain skill in applying safe care practices in clinical settings to reduce medical error
- Value the role of patients and families as members of the healthcare team striving to deliver patient oriented safe care
- Demonstrate effective personal and team behaviors that support just culture and high reliability health system performance
- Advance the goal of the PSMF: "Zero preventable healthcare related deaths by 2020"

Who should use this?

Everyone can benefit from this educational resource! It is designed to be applicable across healthcare professions and relevant to novice learners through expert facilitators. Perhaps your institution has not yet hired a clinical team expert in teaching patient safety. This resource can be effectively facilitated by any clinician willing to teach and learn regardless of their expertise in patient safety.

When is it useful?

The early preclinical years are a perfect time to begin! We have included “lay” scenarios that illustrate patient safety principles that learners can identify with when not yet familiar with the clinical environment. This background will allow healthcare trainees entering the clinical setting to recognize comparable system deficiencies and successes, and individual behaviors that either promote or risk patient safety. The curricular resource is also well suited to clinicians in practice who desire to improve their patient safety knowledge and skills, and to embrace the goals of a culture of safety and patient-oriented safe care.

Where can it be used?

The choice is yours! Resources are provided for classroom-based didactics, cases and videos to promote small group discussion, role play scenarios for skill development, as well as prompts for individual reflection.

Suggestions of opportunities in clinical settings to emphasize patient safety concepts are also offered.

What's in it?

An “executive summary” provides an overview of the content. Identify an area of interest and go to that domain section. Each domain “module” contains

- A sticky note to highlight relevance of this domain to national patient safety goals
- Domain definition
- Learning objectives
- Examples of competency achieved
- Role play materials (limited domains)
- Resources for learners and facilitators

How can it be implemented?

Implementation begins with you! Consider your personal interaction with learners. What opportunities to emphasize patient safety concepts already exist? How can you optimize these teaching moments?

Engage colleagues!

- Introduce colleagues to this resource
- Work together to seek opportunities to integrate patient safety concepts, with minor adjustment, to existing curricular materials

- Identify patient safety curricular gaps you wish to address

Foster learning!

- Identify your learners' current level of development:
 - o Select a teaching strategy and resource
 - o Determine how your learners will reflect competency

Curricular integration!

Use this resource selectively or the curricular resource can be adopted in its entirety as a developmental thread over a multi-year program integral to your healthcare clinicians' professional development.

This resource is designed to be flexible to meet your needs!

Getting started

Step 1: Facilitator preparation

- Review 8 domains and their subdomains
- Identify areas of interest or need
- Consider existing opportunities to integrate patient safety emphasis

Step 2: Curricular preparation

- Select educational target
- Review learning objectives (LO) for your learners' level of competence
- Select teaching method and material or clinical setting
- Review examples of how competency of the LO might be demonstrated

Step 3: Engage learners

- Set expectations for learners
- Engage learners with content in a variety of ways (small group, classroom, clinical setting, etc.)
- Learner assessment via debrief, discussion, reflection, observation, etc.

Step 4: Competency and next steps

- Competency achieved
 - o Progress to more advanced learner level
 - o Address another area of patient safety development
- Competency not demonstrated
 - o Pursue new approach at same learner level

Table 1: Recommended patient safety competency goals for clinical learners and practitioners

An early learner or novice (N) is able to "recognize" recently gained knowledge, an advanced beginner (AB) can "articulate" what has been learned. A competent (C) individual can do this but also "values" the applicability of the learning reflecting an attitudinal development. A proficient (P) individual "models" valued knowledge and behaviors for others. Finally, an expert

(E) advances from modeling to actively teaching the knowledge, skills, attitudes, and behaviors they exemplify. (Based on Benner, Novice to Expert, Nursing Pathways for Patient Safety; 2001, Prentiss Hall)

Participant Level	Foundational Domains	Linking Domains	Aspirational Domains
	Error Science, System Science Technology, Human Factors	Teamwork/ Communication, Leadership/Leading Change	Culture of Safety, Patient Oriented Safe Care
Preclinical Student	AB	N	N
Clinical Student	C	AB - C	AB - C
Early Practice/ Residency	C - P	C - P	C - P
Independent Clinical Practice	C - E	C - E	C - E

Novice (N), Advanced Beginner (AB), Competent (C), Proficient (P), Expert (E)

Executive Summary

Domains

The PSMF has elected to manage the growing content of patient safety by identifying 8 domains. Each domain is further defined by multiple sub-domains. We understand that these domains are in reality interdependent, non-exclusive, and that materials relegated to one might be appropriate in several. To better understand the inter-relationship of domains, we categorize them as either “foundational”, “linking”, or “aspirational”. The diagram below attempts to capture the fluid nature of domain inter-relationships.

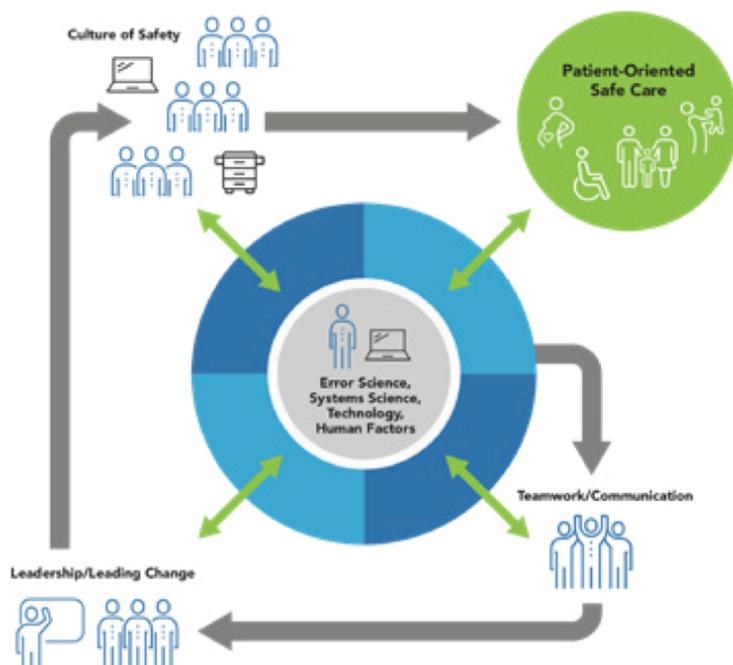


Figure 1: Creating a culture of safety challenges the idea of a hierarchy in patient care. Instead hierarchy is replaced with an integrative approach including the patients, family members, and healthcare professionals while combining technology, systems, and communication methods in order to achieve the most patient-centered care possible.

“Foundational” domains

4 domains of content that provide a foundation of the science of patient safety and facilitate learners’ understanding of medical error and change needed to prevent harm.

1. **Error science** - This domain addresses the spectrum of error introducing concepts of human factors, human and technology interface, and error prone complex systems. Content to improve patient safety through understanding and management of clinical risk, utilization of effective error reporting systems, root cause analysis performance, and application of continuous quality improvement is highlighted.
 - Spectrum of error
 - Understanding and managing clinical risk
 - Error reporting systems
 - Root cause analysis
 - Quality improvement
2. **System science** - A domain dedicated to the understanding of healthcare delivery as a paradigm of a complex system, and to comparing and contrasting attributes of high reliability organizations (HROs) with the current healthcare delivery model, with application of these principles to integrated healthcare systems to improve patient safety.
 - Complex systems
 - High reliability organizations
 - Integrated healthcare systems
3. **Human factors** - This domain addresses the interaction of humans and health systems by providing better understanding of the cognitive, physical, and psychological attributes of clinicians practicing in the healthcare environment, and a rationale for applying human factors engineering to health system design.
 - Human cognition
 - Systems I and II thinking (clinical reasoning)
 - Human factors engineering
4. **Technology** - This domain addresses the expanding role of technology in healthcare delivery and its impact on patient safety. Focus is on the human and tech interface and knowledge, skills, attitudes, and behaviors needed to utilize technology for the benefit of safe care while recognizing that rapid developments, such as artificial (augmented) intelligence, will create new benefits and challenges.
 - Impact of technology on patient safety
 - Human and tech interface
 - AI
 - Clinical value and limitations

“Linking” domains

2 domains of content that are integral to all aspects of patient safety and reducing medical error.

1. **Teamwork and communication** - This domain addresses the concept of teams in healthcare delivery, and the knowledge, attitudes, skills, and behaviors required of

effective teams to deliver safe care. Error prone “gaps” in care are highlighted with content offering validated communication frameworks to ensure patients’ safe transitions across the healthcare experience.

- “Teams” in health care
 - Handoffs and gaps
 - TeamSTEPPS
2. **Leadership and leading change** - This domain emphasizes the critical role of leadership amongst team members, and at all levels of health systems, as well as the knowledge, skills, attitudes, and behaviors needed to effect meaningful changes to deliver safe care.
- Role of leadership in patient safety
 - System engagement (board to frontline)

“Aspirational” domains

2 domains that embody our goal to provide safe care in an interprofessional, just, and cooperative culture that includes patient and family as team members and will benefit health and well-being of patients and caregivers.

1. **Culture of safety** - This domain compares and contrasts the current culture of healthcare with an ideal culture that would promote patient safety. It addresses elements of organizational culture, professionalism, ethics, and disclosure, including the knowledge, skills, attitudes, and behaviors required to develop a “culture of safety” and an effective learning system.
- Landscape of healthcare and how we got here
 - History and epidemiology of medical error
 - Just culture
 - Organizational culture
 - Learning systems
 - Rewarding just culture and maintaining momentum
 - Professionalism and ethics
 - Disclosure
 - Care for the caregiver
2. **Patient oriented safe care** - This domain is devoted to patients and families navigating healthcare with attention to relationship centered communication, engagement as valued team members, and appreciation of “safe care” from the recipient’s perspective.
- Relationship centered communication
 - Engaging patients and families as team members
 - Patient perspective of “safe care”

Error science

A foundational domain

This domain addresses the spectrum of error introducing concepts of human factors, human and technology interface, and error-prone complex systems. Content to improve patient safety through understanding and management of clinical risk, utilization of effective error reporting systems, root cause analysis performance, and application of continuous quality improvement is highlighted.

Subdomain 1: Spectrum of error & understanding and managing clinical risk

Novice - Recall clinical characteristics linked to error risk whose appropriate management benefits patient safety.

Examples of ways competency in this learning objective might be demonstrated:

- Following discussion of an inpatient case, learner identifies human factors, elements of the human and tech interface, and complex systems patient that impact clinical risk.
- Following observation in an emergency department, learner reports on clinicians approach to appropriately manage patients' clinical risk to benefit patient safety.
- Following viewing of a PSMF video, learner reflects on how attention to the patient's clinical risk management might have altered outcome.
- Following a didactic session, learner lists patient characteristics that increase clinical risk.
- Following discussion of impact of individual characteristics that increase error risk, learner identifies patient types at risk for: falls, increased length of stay, suboptimal patient experience, increased cost of stay, etc.
- List clinical characteristics that increase patient risk for medical error (e.g. advanced age, multiple comorbidities, polypharmacy, intellectual disability or dementia, poor family support, etc.).
- Learner describes categories of medication errors which can impact patient safety
- Following observation of a clinical encounter the learner reflects on appropriate use of information in the formation of a diagnosis.

Advanced beginner - Categorize clinical error risk based on patient characteristics and identify appropriate management to benefit patient safety.

Examples of ways competency in this learning objective might be demonstrated:

- Following a clinical experience, learner compares and contrasts safe vs error prone episodes of the human and tech interface and care in complex systems impacting error risk and notes appropriate management strategies.
- Following observation in a pharmacy, learner shares in small group discussion types of clinical error risk noted and proposes appropriate management to benefit patient safety.
- During attendance on daily inpatient "work" rounds, learner comments on patients' clinical characteristics linked to error risk and proposes appropriate management to benefit patient safety.
- During shift transition/patient handoff, learner articulates patient characteristic impacting clinical error risk and recommends appropriate management to benefit patient safety.
- Compare and contrast characteristics of patients with high risk vs low risk of medical error and impact on outcome (length of stay, cost of care, morbidity and mortality, patient experience, etc.).
- Following attendance at M&M conference, learner articulates the continuum of error

from near miss to sentinel events.

- Following reading assignment, learner compares and contrasts high volume-low acuity error risk with low volume-high acuity error risk.
- Learner prepares for case discussion by analyzing or diagramming the elements of the history, the physical exam and diagnostic information that will support options within the differential diagnosis.

Competent - *Interpret* clinical error risk based on patient characteristics and appropriately *manage* care to benefit patient safety.

Examples of ways competency in this learning objective might be demonstrated:

- During medication reconciliation, learner incorporates understanding of clinical error risk of the human and tech interface to benefit patient safety.
- During outpatient clinic practice, learner includes patient characteristics impacting clinical error risk in management strategies.
- During inpatient acute care work, learner interprets patients' clinical error risk and individualizes management to benefit patient safety.
- During patient handoffs, learner shares interpretation of clinical characteristics that impact clinical error risk to facilitate appropriate management to benefit patient safety.
- Learner takes a "clinical time out" after assigning a diagnosis to ensure control of biases in thought process.

Proficient - *Models* incorporation of clinical error risk based on patient characteristics and *justifies* plan of care to benefit patient safety.

Examples of ways competency in this learning objective might be demonstrated:

- Demonstrates the incorporation of clinical error risk involving use of technology, complex systems of care delivery, and individualized patient characteristics, and notes rationale during team-based patient care to benefit patient safety.
- Utilizes emergency department setting to model application of clinical risk assessment to determine staffing needs for patients requiring admission.
- Utilizes outpatient clinic setting to demonstrate how incorporation of clinical risk assessment impacts decision making in patients' plan of care (e.g., manages risks of giving a pm diuretic to an elderly patient with gait abnormality by taking appropriate measures).
- While filling medication prescriptions, models incorporation of clinical error risk to determine approach to medication packaging to benefit patient safety.
- During patient handoffs, discusses clinical characteristics and appropriate management measures to benefit patient safety.
- Models management of inpatient care by assessing and addressing increased risk of delirium in a patient requiring anesthesia by increasing cues for patient's orientation.
- Models a "diagnostic time out" for learners when developing a differential and prioritizing a diagnosis.

Expert - *Teaches* recognition and incorporation of patient characteristics impacting clinical error risk in case management to benefit patient safety.

Examples of ways competency in this learning objective might be demonstrated:

- Utilizes a video example to teach novice learners to recognize patient characteristics that

impact error risk during clinical care.

- Utilizes case discussion to teach early learners the error risks associated with human fallibility, the use of technology, and care delivery in complex systems.
- Provides real time feedback for learners caring for patients in the acute care setting as to appropriate management of increased error risk based on patients' clinical characteristics.
- Commends caregivers during patient handoff who incorporate clinical error risk in verbalized management plan.
- Explains during M&M conference how recognition and incorporation of clinic error risk assessment would have altered outcome.
- Teaches in pharmacy setting alternatives to standard medication packaging based on assessment of clinical error risk to benefit patient safety.
- Develops proposal for system improvement using Failure Modes and Effects Analysis (FMEA) approach to address opportunity to reduce post-anesthetic delirium.
- Teaches learners the application and value of a "diagnostic time out" to ensure eliminational of biases in diagnostic pr

Subdomain 2: Error reporting systems; root cause analysis; quality improvement (QI)

Novice - Recall role of error reporting and analysis as it informs QI in patient safety.

Examples of ways competency in this learning objective might be demonstrated:

- Following discussion of a case, learner avoids attitude of blame/shame and seeks system cause.
- Following viewing of video demonstrating missed communication, learner recalls reporting mechanism and benefits of reporting.
- Following a didactic session on error science, learner discusses rationale for error reporting and investigation.
- Following engaged observation in a pharmacy setting, learner discusses in small groups the mechanism for reporting errors and process of investigation.
- Following observation in an outpatient clinic, learner documents completeness of error reporting for the benefit of QI.
- Demonstrates mindfulness of errors occurring in clinical setting.

Advanced beginner - Support the value of error reporting and analysis to inform QI in patient safety.

Examples of ways competency in this learning objective might be demonstrated:

- In small group setting while discussing clinical case involving wrong site surgery, learner articulates need for error analysis.
- In the outpatient setting, clarifies whether a failure to contact patients with lab results in a timely manner should be reported as an error.
- In the acute care setting, learner requests help reporting a medication error.
- In the pharmacy setting, learner notifies supervisor of reportable error concern.
- Questions peer during patient handoff whether patient's fall has been noted in error reporting system.

- Observes and reports to team peers any concern regarding potential error.

Competent - *Participates* in error reporting and analysis to inform QI in patient safety.

Examples of ways competency in this learning objective might be demonstrated:

- Demonstrates reporting of “near miss” insulin dosing error.
- Notes during inpatient daily “work” rounds that patient’s IV error due to equipment malfunction has been reported.
- Pharmacy staff member follows up with patient’s primary care clinician to discuss results of root cause analysis report regarding medication error incident.
- Participates effectively by providing error details to facilitate root cause analysis.
- Implements recommendations provided by QI team to benefit patient safety.
- Participates in error disclosure to patient and family using the Agency for Healthcare Research and Quality (AHRQ) Communication and Optimal Resolution (CANDOR) template to ensure patient and family understanding.
- Welcomes input from any team member re: potential/suspected error.

Proficient - *Expresses* satisfaction with error reporting and analysis to inform QI in patient safety.

Examples of ways competency in this learning objective might be demonstrated:

- Shares with team during inpatient daily “work” rounds the positive outcomes of near miss error reporting.
- Shares with colleagues during M&M conference, the benefit of error reporting and QI to improve patient safety.
- Discusses with interprofessional team the value of error reporting from multiple clinical perspectives.
- Reflects on potential benefits to patient safety with recently implemented process changes based on error reporting and analysis.
- Models disclosure of error to patient and family using CANDOR template to ensure adequacy of discussion.
- Elicits feedback from team regarding potential errors and appropriate measures to avoid them.

Expert - *Teaches* methods and benefits of error reporting and analysis to inform QI in patient safety.

Examples of ways competency in this learning objective might be demonstrated:

- Teaches novice and advanced beginner learners the value of error analysis and the need to avoid attitude of blame.
- Teaches novice learners via didactic session the methods and benefits of error reporting and how this informs safer patient care.
- Explains to team on inpatient work rounds the value of “near miss” reporting as its analysis will inform QI in patient safety.
- Assists learner with error reporting process following medication dosing error in the pharmacy.
- Commends colleague who participates in error analysis and QI to assist others in delivering safe care.

- Teaches peers in group setting how error reporting, analysis, and subsequent QI have impacted patient safety in their health system.
- Teaches novice and advanced beginners how to communicate with patients and families to properly disclose error used accepted templates, e.g., CANDOR.
- Teaches novice and advanced beginners their role in speaking up to the team re: potential error.

Resources

I. Videos and stories

- A. Survivors
 1. Alicia Cole (video and written story)
- B. Preventable death: Listed are patient stories in video and written form provided by the PSMF. These provide an opportunity to personalize a patient's experience and provide a learning opportunity for the student.
 1. Alex James (written story only)
- C. Provider stories
- D. Other relevant videos
 1. 5 Whys? <https://www.youtube.com/watch?v=BEQvq99PZwo>
 2. The "To Err Is Human Documentary" provides teaching opportunities for the healthcare student. The following clips illustrate concerns relevant to Error Science:
 - a) Sue Sheridan 2:06, 8:06
 - b) Mark Chassin M.D. 43:08-43:38

II. Clinical cases

- A. "Mrs. M", The Washington Manual of Patient Safety and Quality Improvement, 2016, page 123.

III. Local experiences

- A. Lay examples - What is the difference in outcome between reporting and not reporting the following errors?
 1. A new bank teller notes that in new bundles of \$1.00 bills, they are sticking together and is more careful in counting the cash dispensed to customers.
Version 1: Teller does not report this. At the end of the day, 2 other tellers are short in their cash accounting and must stay late to understand what happened.
Version 2: Teller reports this. Similar reports have been made regarding sticking of bills from new bundles. A decision is made to put all the bundled bills through a shuffler several times before placing in tellers' cash drawers.
 2. Food from the office party is accidentally left out on the counter overnight. The worker responsible for clean-up is embarrassed and slips it into the refrigerator the next a.m. without admitting the mistake. Co-workers dig into the leftovers during their lunch break that day and wish they hadn't.
 3. A gas station attendant put diesel fuel in your new expensive sports car that takes high octane regular fuel.
- B. Clinical examples

1. An elderly patient slips to the floor and is helped back into bed by a hospital employee. The employee is unclear what events require reporting and how to do this. Since the patient does not seem hurt, no report is filed.
2. A pharmacy tech notices that a patient needing special single dose packaging has a vial of a month's supply of med waiting for pickup. The tech reports the concern and the team discusses how this error occurred. A new process is developed to prevent such errors and shared with the pharmacy employees.
3. Staff have been encouraged to report all med errors and near misses and are initially diligent but lose enthusiasm after never receiving feedback on the impact of their reporting efforts.

IV. Online resources

- A. IHI Patient Safety 102, From Error to Harm (Lesson 1,2 and 3); Boston, MA: Institute for Healthcare Improvement; 2018; available on www.IHI.org
- B. IHI Patient Safety 105, Responding to Adverse Events (Lesson 1,2,3 and 4); Boston, MA; Institute for Healthcare Improvement; 2018; available on www.IHI.org
- C. IHI Patient Safety 201, Root Cause and Systems Analysis (Lesson 1,2 and 3); Boston, MA; 2018; available on www.IHI.org
- D. Pennsylvania Patient Safety Authority- <http://patientsafety.pa.gov/> (This organization has the largest US repository of annual error reporting)
- E. 2017 Annual Report <http://patientsafety.pa.gov/PatientSafetyAuthority/Pages/AnnualReports.aspx>
- F. WHO Multi-Professional Patient Safety Curriculum. Handouts http://www.who.int/patientsafety/education/mp_curriculum_tools/en/index3.html
- G. WHO Multi-Professional Patient Safety Curriculum. Power points http://www.who.int/patientsafety/education/mp_curriculum_tools/en/index4.html
- H. National Coordinating Council for Medication Error Reporting and Prevention: <https://www.nccmerp.org/types-medication-errors>
- I. NCC MERP Med Error Categories- <http://patient.sm/med-error-categories>
- J. NCC MERP Med Error Algorithm- <http://patient.sm/med-error-algorithm>
- K. AHRQ Patient Safety Network. Handoffs and Transitions <https://psnet.ahrq.gov/perspectives/perspective/170/Handoffs-and-Transitions> This needs to move to Teamwork and Communication!
- L. Medication Reconciliation: The Key Patient Safety Issue for Healthcare Providers <https://cdn2.hubspot.net/hubfs/4184981/Content/eBooks/Cureatr-eBook-MedRec-LR1.pdf>
- M. Root Cause Analysis in Health Care: Tools and Techniques. Joint Commission. <https://www.jcrinc.com/assets/1/14/EBRCA15Sample.pdf>
- N. PQA Medication Therapy Problem Categories Framework. Pharmacy Quality Alliance. <https://www.pqaalliance.org/assets/Measures/PQA%20MTP%20Categories%20Framework.pdf>. Accessed August 23, 2019.
- O. Performance Measurement. The Joint Commission. https://www.jointcommission.org/performance_measurement.aspx Accessed August 23, 2019. This one should be deleted. Not sure what the connection is to our material here!

V. Didactic resources

- A. Understanding Patient Safety, 3rd Edition, RWachter and KGupta, Chapter 14 “Reporting Systems, Root Cause Analysis, and other Methods of Understanding Safety Issues”
- B. The Washington Manual of Patient Safety and Quality Improvement, 2016,
 - 1. Chapter 6 “Accountability and Reporting”
 - 2. Chapter 13 “Event Analysis”
- VI. Suggested reading
 - A. “The Problem with Incident Reporting”, Macrae C. BMJ Qual Saf 2016;25:71-75
 - B. “What to do with Healthcare Incident Reporting Systems”, Pham JC. J Public Health Res 2013;2:e27
 - C. “Adverse Event Reporting Practices by US Hospitals: Results of a National Survey”, Farley DO. Qual Saf healthcare 2008;17:416-423
 - D. “Patient Safety Incident Reporting: A Qualitative Study of Thoughts and Perceptions of Experts 15 Years after ‘To Err is Human’ ”, Mitchell I. BMJ Qual Saf 2016;25:92-99
 - E. “RCA2: Improving Root Cause Analysis and Actions to Prevent Harm”, National Patient Safety Foundation; 2015
 - F. Morbidity and mortality conferences: Their educational role and why we should be there. Epstein NE. Surg Neurol Int. 2012;3(Suppl 5):S377-88. doi: 10.4103/2152-7806.103872. Epub 2012 Nov 26.
 - G. Just-in-Time Training for High-Risk Low-Volume Therapies: An Approach to Ensure Patient Safety. Helman S, Lisanti AJ, Adams A, Field C, Davis KF. J Nurs Care Qual. 2016 Jan-Mar;31(1):33-9. doi: 10.1097/NCQ.0000000000000131.
 - H. The published literature on handoffs in hospitals: deficiencies identified in an extensive review. Cohen MD, Hilligoss PB. Qual Saf Health Care. 2010 Dec;19(6):493-7. doi: 10.1136/qshc.2009.033480. Epub 2010 Apr 8. Keep but move to Teamwork/ Communication
 - I. Effect of Electronic Health Record Implementation in Critical Care on Survival and Medication Errors. Han JE, Rabinovich M, Abraham P, Satyanarayana P, Liao TV, Udoji TN, Cotsonis GA, Honig EG, Martin GS. Am J Med Sci. 2016 Jun;351(6):576-81. doi: 10.1016/j.amjms.2016.01.026. Epub 2016 Apr 13.
 - J. Health information exchange and patient safety. Kaelber DC, Bates DW. J Biomed Inform. 2007 Dec;40(6 Suppl):S40-5. Epub 2007 Sep 7.
 - K. The alarming reality of medication error: a patient case and review of Pennsylvania and National data. da Silva BA, Krishnamurthy M. J Community Hosp Intern Med Perspect. 2016 Sep 7;6(4):31758. doi: 10.3402/jchimp.v6.31758. eCollection 2016.

System science

A foundational domain

A domain dedicated to the understanding of healthcare delivery as a paradigm of a complex system, and to comparing and contrasting attributes of high reliability organizations (HROs) with the current healthcare delivery model, with application of these principles to integrated healthcare systems to improve patient safety.

Subdomain 1: Complex systems

Novice - Describe complex multistep medical systems as a series of discrete processes and

their potential to impact medical error and patient safety.

Examples of ways competency in this learning objective might be demonstrated:

- Following case discussion of a patient's experience receiving healthcare, learner can define medical error and describe discrete processes within the system that impact medical error.
- Following observation of a video involving patient and family experience receiving healthcare, learner can describe discrete processes within the system that impact medical error.
- Following observation of a patient experience in the ED/outpatient office/pharmacy/etc., learner records/journals discrete processes of the complex multistep medical system and their potential to impact medical error.
- Following observation, creates a "process map" of a discrete process within a complex multistep medical system.

Advanced beginner - *Compares and contrasts* complex multistep medical systems as a series of discrete processes and their potential to impact medical error.

Examples of ways competency in this learning objective might be demonstrated:

- Following case discussion of a patient with sepsis, learner compares and contrasts discrete processes within the system and their impact on medical error, patient outcome, length of stay, and cost of care to system and patient.
- Following observation of a video involving patient and family experience receiving healthcare, learner articulates how discrete processes within the system either reduce or increase the potential for medical error.
- Following engaged observation of activity in the outpatient lab, learner reflects on discrete processes within the multistep system that increase potential for medical error.
- Following engaged observation in the pharmacy, learner reflects on discrete processes within in the system that impact medication safety.
- Following group discussion of personal experiences in healthcare, learner reflects on improved design of one discrete process with potential to impact medical error.

Competent - *Utilize* complex multistep medical systems, understanding they consist of a series of discrete processes with potential to reduce medical error.

Examples of ways competency in this learning objective might be demonstrated:

- In clinical teams, navigates processes of complex multistep medical systems with awareness of their potential to impact medical error.
- In clinical settings, applies processes of complex multistep medical systems during transitions of care.
- In clinical settings, reflects on improvement in personal interaction with complex multistep medical systems to reduce medical error.
- In clinical settings, reflects on improvement in discrete processes within complex multistep medical systems to reduce medical error.

Proficient - *Model* successful navigation of complex multistep medical systems consisting of a series of discrete processes to reduce medical error.

Examples of ways competency in this learning objective might be demonstrated:

- In clinical settings, models successful navigation of complex multistep medical systems to increase others' awareness of their potential to impact medical error.
- In clinical settings, identifies and proposes improvements for discrete processes prone to medical error.

Expert - Teach recognition and successful navigation of complex medical systems as a series of discrete processes with potential to reduce medical error.

Examples of ways competency in this learning objective might be demonstrated:

- Designs effective didactic educational activities to highlight complex multistep medical systems as a series of discrete processes and their potential to impact medical error and appropriately assesses effectiveness of education.
- Uses videos of patient and family experiences in complex medical systems to teach discrete process components and their potential to reduce medical error.
- Shares a patient case from personal practice experience to compare and contrast safety of discrete processes in a complex medical system and potential to reduce medical error.
- Teaches vigilance of discrete processes in complex medical systems seeking improvements to reduce medical error.
- Utilizes opportunities in peer meetings to draw attention to opportunity for process improvement in the complex medical system to reduce medical error.
- Applies a process of ongoing self-evaluation and personal performance improvement that promotes continued learning of complex multistep medical systems as a series of discrete processes and their potential to impact medical error.

Subdomain 2: High reliability organizations (HROs)

Novice - List the principles of an HRO and their potential impact on patient safety.

Examples of ways competency in this learning objective might be demonstrated:

- Following a didactic session, learner lists principles of an HRO and potential impact on patient safety.
- Following an assigned reading, learner reports principles of an HRO and potential impact on patient safety.
- Learner reports on an industry outside of healthcare industry that has successfully adopted the principles of an HRO.

Advanced beginner - Analyze the principles of an HRO and their potential impact on patient safety.

Examples of ways competency in this learning objective might be demonstrated:

- Following an assigned reading describing an HRO outside of healthcare, learner articulates why our current healthcare system would/would not qualify as an HRO.
- Following discussion comparing and contrasting HROs and healthcare delivery, learner proposes alterations in the latter to improve patient safety.
- Following a clinical experience, learner reflects on principles of how principles of an HRO would impact patient safety.

Competent - Value the principles of an HRO and their potential impact on patient safety.

Examples of ways competency in this learning objective might be demonstrated:

- Learner practices principles of an HRO as they apply to the individual in clinical settings.
- Following a clinical experience, learner reflects on personal and system improvements to better match the principles of an HRO and favorably impact patient safety.
- While participating in professional peer review cases, learner reflects how application of principles of an HRO would have impacted patient safety.

Proficient - *Model* engagement with principles of an HRO to impact patient safety.

Examples of ways competency in this learning objective might be demonstrated:

- In clinical settings, models and promotes behaviors consistent with principles of an HRO to impact patient safety.
- In case discussions, articulates for other learners how principles of an HRO impact patient safety.
- Advises adherence to principles of an HRO while participating in quality efforts including but not limited to root cause analyses, work/peer review, and “patient experience” improvement endeavors.

Expert - *Teach* principles and application of principles of an HRO to impact patient safety.

Examples of ways competency in this learning objective might be demonstrated:

- Designs effective didactic educational activities to highlight principles of HRO and the associated impact on patient safety and appropriately assesses effectiveness of education delivered.
- In case discussions, articulates for other learners how principles of an HRO apply to impact patient safety.
- Provides feedback to learners reflecting on how principles of an HRO would impact patient safety.
- Proposes adoption of, and actively participates in development of, changes in healthcare system to reflect principles of an HRO.
- Applies a process of ongoing self-evaluation and personal performance improvement that promotes continued learning surrounding high reliability organizations.

Subdomain 3: Integrated healthcare systems

Novice - *Discuss* the complexity of health care and its interaction with a multitude of systems as it relates to patient safety.

Examples of ways competency in this learning objective might be demonstrated:

- Following case discussion, defines “integrated healthcare system” and lists discrete entities involved in the patient’s care across an integrated healthcare system.
- Following a PSMF video, reports phases of care delivery in an integrated healthcare system and how they interact.
- Following a clinical experience, learner journals on the involvement of systems within the integrated care system as they relate to patient safety.

Advanced beginner - *Articulate* causes of health care complexity and its interaction with a multitude of systems as it relates to patient safety.

Examples of ways competency in this learning objective might be demonstrated:

- Following a clinical experience, compares and contrasts integrated healthcare vs non-integrated healthcare delivery systems as it relates to patient safety.
- Following small group discussion of a patient case involving frequent healthcare utilization, learner articulates pros and cons of integrated healthcare delivery systems.
- Following viewing of a PSMF video, learner reflects on complexity of healthcare and its interaction with a multitude of systems as it relates to patient safety.

Competent - Operate successfully the complexity of healthcare and its interaction with a multitude of systems to improve patient safety.

Examples of ways competency in this learning objective might be demonstrated:

- In clinical settings, navigates successfully the discharge of a patient to a community facility involving multiple systems with attention to patient safety.
- In clinical systems, learner receives and appropriately executes orders from another facility to dispense medication/healthcare services/etc., while navigating a complex healthcare system successfully to improve patient safety.
- Following a suboptimal outcome in a patient's care delivery, learner reflects on the opportunity to improve navigation across the complexity of healthcare to improve patient safety.

Proficient - Demonstrate successful navigation of the complexity of healthcare and its interaction with a multitude of systems to improve patient safety.

Examples of ways competency in this learning objective might be demonstrated:

- In clinical settings, models successful navigation of a patient admission process from hospital to community facility involving multiple systems while improving patient safety.
- Seeks opportunities to improve patient safety in the appropriate dispensing and use of medications as patients cross healthcare settings.
- Advocates appropriate information transfer to improve patient safety as patients interact with multiple healthcare settings.

Expert - Teach understanding and successful navigation of the complexity of healthcare and its interaction with a multitude of systems as it relates to patient safety.

Examples of ways competency in this learning objective might be demonstrated:

- Designs effective didactic educational activities to highlight features of integrated healthcare systems and appropriately assesses effectiveness of education delivered.
- Uses PSMF videos to teach learners to identify high risk transition points as patients utilize a complex healthcare system.
- Participates in peer review to understand gaps and promote improvement in care delivery across complex systems.
- Utilizes M&M conferences, morning report, huddles, etc. to teach impact of successful navigation on patient safety.
- Applies a process of ongoing self-evaluation and personal performance improvement that promotes continued learning surrounding integrated healthcare systems.

Resources

I. Videos and stories

A. Survivors

1. Duane Smith story- <http://patient.sm/duane-smith-case-discussion>

B. Preventable death

Listed are patient stories in video and written form provided by the PSMF. These stories provide an opportunity to personalize a patient's experience and provide a learning opportunity for the student.

1. Jem Darling (video and written story)
2. Lewis Blackman (video and written story)
3. Rory Staunton (video and written story)
4. Chris Salazar (video and written story)
5. Kate Hallisy (video and written story)
6. Alicia Cole (video and written story)
7. Emily Jerry (video and written story)

C. Provider stories

D. Other relevant videos

1. The "To Err is Human" documentary (accessible via <https://www.toerrishumanfilm.com/>) provides teaching opportunities for the healthcare professional in training. The following clips are relevant to System Science:
 - a) Jason Sajulan 48:00-48:30
 - b) Capt "Sully" Sullenberger 45:20, 46:50
 - c) Sam Effasy 45:07 45:20
 - d) Bob Wachter M.D. 22:46-25:01
 - e) Don Berwick M.D. 16:16-16:40
2. System impact on sinking of the R.M.S. Titanic https://www.youtube.com/watch?v=GOVeO5_0qD0

II. Clinical cases

- A. Episode of Wrong Side Surgery Facilitator Guide: <http://patient.sm/wrong-side-surgery-facilitator>
- B. Not for IV Use: The Story of an Enteral Tubing Misconnection, Case Studies in Patient Safety, JJohnson, HHaskell, PBarach, 2016
- C. "An Extended Stay", R Hilliard, MD; IHI Open School. Learning objective: Explain how system failures can lead to patient harm.

III. Local experiences

A. Lay examples

1. You arrive at the airport eager to set off on vacation. The takeoff is delayed due to bad weather and you miss the connecting flight to your destination. How did a complex system impact your experience? Is the airline industry an HRO?
2. Your sibling is training as a nuclear engineer and will be at sea for several months. What are the principles of an HRO? How will the adherence of this program to principles of an HRO impact your sibling's safety?
3. Unaccompanied minor for air travel
 - a) Facilitator guide: <http://patient.sm/unaccompanied-minor-facilitator>

- b) Student guide: <http://patient.sm/unaccompanied-minor-student>
- 4. Hot coffee spill
 - a) Facilitator guide: <http://patient.sm/hot-coffee-spill-facilitator>
 - b) Student guide: <http://patient.sm/hot-coffee-spill-student>
- B. Clinical examples
 1. Your parent is transported via EMS to the ED and admitted with sepsis to an ICU setting. CMS has established sepsis care guidelines (2015) which includes timely assessment and intervention with specific treatment guidelines. How do systems impact a facility's ability to meet CMS guidelines? How does meeting guidelines impact patient outcome? Length of stay? Cost of care? Patient satisfaction?
 2. You provide patient care in a large integrated healthcare system. Compare and contrast this with care provided in a non-integrated setting.
 3. A new pharmacy tech notes a potential for error in med dispensing for sound alike drugs. How should this individual act to meet HRO standards? How should supervisors act? What steps would be taken?
 4. Suggested prompts for subsequent cases: Define "system". What characteristics are necessary for system performance excellence? What is the role of leadership? Role of the "front line"? What is your role as part of the system? What behaviors are needed to achieve personal performance goals as an effective part of the system?

IV. Online resources

- A. IHI Open School Patient Safety (PS) 201 "Root Cause and Systems Analysis" <http://www.ihl.org/education/IHIOpenSchool/courses/Pages/default.aspx> Boston, MA: Institute for Healthcare Improvement; 2018; Available on www.IHI.org
- B. WHO Multi-professional Patient Safety Curriculum Guide, "Systems and the Effect of Complexity on Patient Care" http://www.who.int/patientsafety/education/mp_curriculum_tools/en/index3.html
- C. High Reliability in Healthcare: <http://www.jointcommission.org/highreliability.aspx>
- D. Pathways for Patient Safety, Module 3 "Creating Medication Safety" www.hret.org/quality/projects/resources/creating_medication_safety.pdf (A Partnership: Health Research & Educational Trust Institute for Safe Medication Practices)
- E. Actionable Patient Safety Solutions (APSS) - Patient Safety Movement Foundation (e.g. Falls, Sepsis and more) <https://patientsafetymovement.org/apss>

V. Didactic resources

- A. The Washington Manual of Patient Safety and Quality Improvement, 2016; Chapter 3 "Building High Reliability in the Healthcare System" (includes clinical vignette)

VI. Supplemental reading

- A. "Safeguarding patients: complexity science, high reliability organizations, and implications for team training in healthcare McKean LM. Clin Nurse Spec. 2006;20(6):298-304; (quiz 305)
- B. "Turning Healthcare into a High Reliability Industry: Memorial Hermann Shares 5 Steps". Punke H. Becker's Hospital Review, 2013.
- C. "Creating High Reliability in Healthcare Organizations". Pronovost PJ. Health Serv Res. 2006;41:1599-1617

Human factors

A foundational domain

This domain addresses the interaction of humans and health systems by providing better understanding of the cognitive, physical, and psychological attributes of clinicians practicing in the healthcare environment, and a rationale for applying human factors engineering to health system design.

Subdomain 1: Human cognition

Novice - Describe current understanding of human cognition, its role in clinical reasoning, and impact on patient safety.

Examples of ways competency in this learning objective might be demonstrated:

- Following case discussion of a missed diagnosis of new cardiac ischemia in a patient presenting to the ED with a history of chronic pain from pancreatitis, learner defines heuristic error.
- Following a didactic session, learner defines heuristics including anchoring, affective bias, availability bias, context errors and premature closure.
- Following a didactic session, learner defines basic concepts in perception, memory (working memory, prospective memory), and situation awareness. Agree with edit from SKazi added here
- Following observation of a video of a clinical interaction, learner identifies the heuristics involved.
- Following an observation in the ED, learner documents how clinicians act to avoid heuristic errors to benefit patient safety.
- Lists internal and external factors that impact cognition and may lead to error.
- Following a shift in a clinical setting, learner reports observations of changes in cognition and impact on interaction between clinician and patient and family.

Advanced beginner - Compare and contrast concepts in human cognition, consequences for clinical reasoning, and impact on patient safety.

Examples of ways competency in this learning objective might be demonstrated:

- Reviews electronic health record where discharge diagnosis does not match admission diagnosis to identify heuristic employed and potential alternative to benefit patient safety (variable).
- In small group, discusses a case of missed diagnosis of DKA in a patient frequently seen in the ED with long standing alcohol abuse (anchoring).
- Reflects on incidence of missed diagnoses in minority patients, role of heuristics, and impact on patient safety (affective bias).
- Presents to group on the case of a patient presenting with chest pain presumed as cardiac but subsequently identified as due to zoster (context).
- Discusses in small group the case of a patient with recent onset low back pain in whom a diagnosis of lumbar disc disease is made prematurely (premature closure).
- Reflects on ability to provide safe care when functioning in an environment with favorable vs unfavorable internal or external factors.
- Discusses in small group the case of patient receiving warfarin for atrial fibrillation with

consistently subtherapeutic INRs presumed to be medication nonadherence; later identified to be result of liquid nutritional supplementation and consumption of St. John's Wort.

- Learner reflects on concepts of perception, memory (working memory, prospective memory), and situation awareness and impact on diagnostic reasoning.

Competent - *Apply* understanding of human cognition and its impact on clinical reasoning to benefit patient safety.

Examples of ways competency in this learning objective might be demonstrated:

- Approaches each clinical encounter with knowledge of past history but continues to develop a differential diagnosis for current presentation.
- Applies a careful consideration of differential diagnosis to each patient regardless of individual's cultural, social, or personal choices background.
- Includes an appropriate differential for a female presenting with lower quadrant abdominal pain.
- Takes time to fully consider etiology of new onset low back pain in a patient seen in a clinical setting.
- Seeks to maintain favorable internal and external factors to improve patient safety.
- Demonstrates insight into the impact of changes in cognition on relationship between self and patient and family.
- Verbalizes awareness of both internal and external factors on diagnostic reasoning.

Proficient - *Models* understanding of human cognition and its impact on clinical reasoning to benefit patient safety.

Examples of ways competency in this learning objective might be demonstrated:

- Models open mindedness when developing a differential on patients who are frequent users of the health system.
- Models open mindedness when providing pain consultation to chronic consumers of opioid analgesics.
- Practices uniform approach to care of patients regardless of an individual's cultural, social, or personal choices background.
- Models development of an appropriate differential for patients presenting with an undifferentiated complaint.
- Recommends changes to favorably impact the external environment to provide safe care.
- Models self-care and wellness to favorably impact internal factors to provide safe care.
- Models awareness and active resolution of internal and external factors that interfere with diagnostic reasoning.

Expert - *Teaches* current understanding of human cognition, its role in clinical reasoning, and impact on patient safety.

Examples of ways competency in this learning objective might be demonstrated:

- Teaches on rounds open mindedness using a case of nausea and vomiting in a patient frequently seen in the ED with known alcohol abuse.
- Teaches awareness of impact of affective bias as it relates to a population's cultural, sociological, or personal choice background in a didactic session.

- Facilitates discussion at M&M conference of contribution of heuristic error leading to poor outcome.
- Proposes clinical exercise for staff to improve understanding of heuristics, their role in clinical reasoning, and impact on patient safety.
- Advocates for system engagement to support favorable internal and external factors to enhance patient safety.
- Applies a process of ongoing self-evaluation and personal performance improvement that promotes continued learning of the role of human cognition in clinical reasoning and impact on patient safety.
- Teaches learners and peers to identify and resolve internal and external factors that may compromise diagnostic reasoning.

Subdomain 2: Systems I and II thinking (clinical reasoning)

Novice - *Recognizes* the interface between the clinician and clinical environment, and its impact on patient safety.

Examples of ways competency in this learning objective might be demonstrated:

- Following a case discussion, learner is able to note how understaffing in the pharmacy influenced the pharmacist's behavior.
- Following a didactic session, learner lists ways in which the clinical environment can influence clinical reasoning and impact patient safety.
- Following a didactic session, learner lists the impact of confirmation bias in the clinical environment and its impact on patient safety.
- Following review of a PSMF video, learner identifies an aspect of the clinical environment that influences clinical reasoning and impacted outcome.
- Following a clinical observation on an acute care unit, learner lists aspects of the clinical environment that influence clinical reasoning and impact patient safety.
- Following a case discussion involving medical error, recognizes that an individual clinician/individual action could have a beneficial impact.
- Following observation in a clinical setting, answers question "What can I do to reduce error?".
- Following a didactic session, learner recalls the premise of "moral distress" and its impact on patient safety.
- Defines a "diagnostic time out" and its benefits to patient safety.

Advanced beginner - *Articulates* aspects of the interface between clinician and clinical environment, and its impact on patient safety.

Examples of ways competency in this learning objective might be demonstrated:

- Reviews medical/pharmacy records involving an untoward event and draws conclusions regarding the clinician-environment interface and impact on patient safety.
- Following viewing a PSMF video, reconstructs the clinician-environment interface impacting patient safety.
- In small group discussion, predicts the impact of variations in clinical environments that will impact clinician function and patient safety.
- Following observation in a clinical setting, proposes changes to clinician-clinical

environment to benefit patient safety.

- Suggests action to be taken by individual clinician involved in case with medical error to have a beneficial impact.
- Following small group case discussion of patient impacted by medical error, learner articulates the impact of “moral distress” on both provider and patient.
- Following a clinical encounter the learner demonstrates a deliberate “diagnostic time out”.

Competent – *Practices* with awareness of the interface between clinician and clinical environment as it impacts patient safety.

Examples of ways competency in this learning objective might be demonstrated:

- Reflects on a clinical encounter to renew awareness of the impact of the clinician-clinical environment interface on patient safety.
- Applies awareness of clinical environment as it impacts clinical performance and patient safety.
- Practices caution in clinical environments such as the acute care setting and community pharmacy where distractions are frequent to benefit patient safety.
- Employs heightened attention to medication reconciliation for “look alike” and “sound alike” medications to benefit patient safety.
- Acts independently in a case involving medical error to have a positive impact on patient safety.
- Appropriately interprets situations requiring difficult decisions and actions to avoid “moral distress” and negative impact on own wellbeing and patient safety.
- Learner reflects on a clinical encounter as to whether a “diagnostic time out” would have benefitted patient care.

Proficient – *Models* attention to the interface between clinician and clinical environment to benefit patient safety.

Examples of ways competency in this learning objective might be demonstrated:

- Models awareness of reduced clinical staffing when communicating with nursing to benefit patient safety.
- Models active confirmation of correct patient-correct chart in a clinical setting with 2 patients with same/similar names.
- Models avoidance of interrupting staff completing a medication reconciliation process.
- Proposes improvements to the clinician-clinical environment interface to benefit patient safety.
- Proposes system change to mitigate risk involving patient care.
- Shares concern and support for interprofessional colleagues and patients impacted by difficult clinical situations leading to “moral distress”.
- Models the application of a “diagnostic time out” when the clinical environment adds potential for diagnostic error.

Expert – *Teaches* the interface between clinician and clinical environment, and its impact on patient safety.

Examples of ways competency in this learning objective might be demonstrated:

- Teaches on daily inpatient work rounds the potential impact of high activity during

change of shift on patient safety.

- Gives in the moment formative feedback to a learner who fails to actively demonstrate the confirmation of correct patient and correct chart on all patients.
- Explains during M&M conference with peers the impact of the clinician-clinical environment interface on case outcome and improvements to benefit patient safety.
- Serves on health system committee to identify opportunities for improvement in the clinician-clinical environment to benefit patient safety.
- Actively involved in system improvement to mitigate risk involving patient care.
- Teaches and encourages individuals to recognize the importance of all individuals' responsibility to advocate for change to mitigate risk involving patient care.
- Presents interprofessional session to educate colleagues and students on "moral distress", its impact on provider and patient safety, and appropriate navigation.
- Applies a process of ongoing self-evaluation and personal performance improvement that promotes continued learning of the interface between the clinician-clinical environment, and its impact on patient safety.

Subdomain 3: Human factors engineering (HFE)

Novice - *Describes* the influence of HFE on the human-system interface to mitigate medical error.

Examples of ways competency in this learning objective might be demonstrated:

- Following a didactic session, learner can list characteristics of clinical environment appropriately addressed by HFE to mitigate medical error.
- Learner identifies an opportunity for HFE changes following case discussion of telemetry monitoring staff missing significant changes during an extended shift.
- Following engaged observation in the pharmacy, learner recalls HFE influences to mitigate medical error.
- Recalling a recent personal experience in healthcare, learner describes the influence of HFE on the human-system interface to mitigate medical error.
- Identifies HFE in everyday living (eg., car brake must be on to put car in gear, ATM card read changed from insert to sweep to avoid cards being left behind, to delete a computer document you must confirm that is your intent, car back-up warning sound).

Advanced beginner - *Predicts* impact of HFE on the human-system interface to mitigate medical error.

Examples of ways competency in this learning objective might be demonstrated:

- Compares and contrasts in small group discussion after viewing a PSMF video the strengths and weaknesses of HFE on the human-system interface to mitigate medical error.
- Predicts the impact of increasing computer font size and brightness in work areas in a health system with providers across the age spectrum.
- Reflects on a clinical experience in an inpatient setting on current and potential additional benefits of HFE to mitigate medical error.
- Reconstructs the process of a near-miss in medication dispensing to identify causes amenable to HFE.
- Reconstructs the process of a near-miss in medication administration to identify causes

amenable to HFE.

- Discuss potential interventions for HFE events in everyday life (e.g., forcing functions, simplify steps, standardize, build in redundancy, checklists, computerization, bar coding, information access.)
- Discusses in interprofessional small group setting potential interventions for HFE in potential traps in healthcare (look alike equipment; sound alike meds).

Competent - *Adopts* HFE changes to the human-system interface to mitigate medical error.

Examples of ways competency in this learning objective might be demonstrated:

- Applies recommendations made by HFE to daily work routine and personal wellness to mitigate medical error.
- Performs daily work rounds without undue rushing to mitigate medical error.
- Practices respect for others involved in clinical tasks to avoid interruption.
- Ensures understanding of new electronic medical record system before navigating independently.
- Values HFE as an approach to reducing medical error.
- Engages patient and family to explain HFE in the clinical treatment area to prevent medical error.

Proficient - *Proposes* HFE changes to the human-system interface to mitigate medical error.

Examples of ways competency in this learning objective might be demonstrated:

- Proposes an increase in computer font size and work area lighting to mitigate medical error.
- Models an organized approach to daily rounds to mitigate medical error.
- Maintains work-life balance to be fully present in the clinical setting to mitigate medical error.
- Models adoption of HFE changes to avoid change of shift times for daily inpatient rounds to mitigate medical error.
- Proposes modification to medication dispensing in the pharmacy for patients receiving anticoagulants to mitigate medical error.
- Proposes HFE assessment of a particular work process to reduce medical error (e.g. simplify, standardize, add redundancy).

Expert - *Explains* the influence of HFE on the human-system interface to mitigate medical error.

Examples of ways competency in this learning objective might be demonstrated:

- Teaches in a didactic session the opportunities for HFE to impact the human-system interface and mitigate medical error.
- Explains during clinical teaching rounds processes addressed by HFE to impact human-system interface to mitigate medical error.
- Justifies need for HFE improvements on the human-system interface in settings such as M&M discussions with peers to mitigate medical error.
- Encourages colleagues to adhere to HFE changes in workflow to mitigate medical error.
- Serves as pharmacy lead to initiate and gain acceptance of HFE changes in medication dispensing process to mitigate medical error.
- Leads a multidisciplinary team to evaluate clinical processes and apply HFE

improvement to work environment to benefit patient safety.

Subdomain 4: Ergonomics and work environment

Novice - *Describes* the impact of ergonomics and work environment HFE to reduce medical error and improve clinician safety.

Examples of ways competency in this learning objective might be demonstrated:

- Following a clinical experience, records ergonomic measures employed to reduce medical error and improve clinician safety (e.g., safety needles to prevent needle sticks, exam bed heights, etc.).
- Following a didactic presentation, reports on role of ergonomics and work environment on both patient safety and provider well being.
- Following a shadowing shift in the pharmacy, learner lists ergonomic measures in place to mitigate error and improve provider safety.
- Following a shadowing experience in a clinical site (ED, OR, office, ward, etc.), learner reports back measures in place in keeping with the Occupational Safety and Health Administration (OSHA) and to prevent clinician burnout.

Advanced beginner - *Compares and contrasts* ergonomic and work environment HFE features between different clinical settings designed to improve patient and provider safety.

Examples of ways competency in this learning objective might be demonstrated:

- Following an interprofessional shadowing experience, learner compares and contrasts ergonomic features in place for providers and patients to mitigate error.
- Following observation of a case in the OR, learner reflects on ergonomic and work environment features of the clinical setting intentionally placed to improve patient and provider safety.
- Following a shift in the outpatient clinic, learner designs a workflow pattern that includes ergonomic and work environment HFE measures to improve patient and provider safety.
- Following a clinical experience (pharmacy, ward, office, ED, PT gym, etc.), learner reflects on measures in place (OSHA) that protect clinicians safety and prevent burnout and considers additional measures to further improve outcomes.

Competent - *Values* ergonomic and work environment HFE changes made to benefit patient and provider safety.

Examples of ways competency in this learning objective might be demonstrated:

- While on teamwork rounds, values the addition of room-based computers as an ergonomic and work environment HFE measure to benefit patients safety and provider well being.
- While completing electronic charting, learner demonstrates use of recommended posture to reduce provider injury.
- While engaging with patients and families, learner appreciates the office flow patterns that improve patient safety and help provider well-being.
- While working in the healthcare environment, applies OSHA regulations in work process and follows system recommendations to reduce burnout.

Proficient - *Proposes* ergonomic and work environment HFE improvements to benefit patient and provider safety.

Examples of ways competency in this learning objective might be demonstrated:

- Following a clinic day, learner proposes a change to patient flow patterns to improve patient safety and reduce provider fatigue.
- Following a day in the OR, learner expresses satisfaction with the ergonomic and work environment considerations of HFE to improve patient safety and provider well-being.
- Following an on-call shift, learner justifies recommended change to call room location to improve patient safety and provider well-being.
- During clinical activities, models adherence to OSHA requirements and system recommendations to reduce burnout.

Expert - Teaches impact of improved ergonomics and work environment on reducing medical error and improving clinician safety.

Examples of ways competency in this learning objective might be demonstrated:

- While on team rounds, points out features of ergonomics and work environment specifically designed to reduce error and provider injury.
- Leads interprofessional team to assess potential changes to hospital ER workflow to benefit patient safety and provider well-being.
- Engages patient and families to explain work environment adjustments that benefit patient safety and provider well-being.
- Recommends to administration that an ophthalmoscope be available and centrally located on each med-surg unit for the benefit of patient safety.
- Gives feedback to support appropriate behavior and improve deficient behavior to enforce OSHA guidelines and system recommendations to reduce burnout.
- Applies a process of ongoing self-evaluation and personal performance improvement that promotes continued learning of the influence of HFE on the human-system interface to mitigate medical error.

Materials for role play

- To access role play materials related to "Human Cognition Role Play" - <http://patient.sm/role-play-human-cognition>
- To access role play materials related to "Handoff Role Play" - <http://patient.sm/role-play-handoff>

Resources

I. Videos and patient stories

A. Survivors

Alicia Cole (video and written story)

B. Preventable deaths

1. Jem Darling (video and written story)
2. Lewis Blackman (video and written story)
3. Rory Staunton (video and written story)

- C. Provider stories
 - 1. Julia Thao (video)
- D. Other Relevant Videos
 - 1. The “To Err is Human” documentary (accessible via <https://www.toerrishumanfilm.com/>) provides teaching opportunities for the healthcare professional in training. The following clips are relevant to Human Factors:
 - a) Tejal Gandhi M.D. MPA 10:43-11:20
 - b) Boaz Keysar 12:20 - 12:40
 - 2. MedStar Health (integration of human factors into healthcare) <https://www.youtube.com/watch?v=5B3CYLye6vc>
 - 3. Terry Fairbanks and Raj Ratwani (applying human factors and safety science to healthcare and health information technology) <https://www.youtube.com/watch?v=aZqsmUpfRPE>
 - 4. Ken Catchpole - Why Medical Error? <https://www.youtube.com/watch?v=u6VuaxC0m5I>
 - 5. Sarah Parker - Good Design, Bad Design <https://www.youtube.com/watch?v=6k7HCyVHfr8>

II. Clinical cases

- A. Clinical Vignette- The Washington Manual of Patient Safety and Quality Improvement, 2016, Chapter 16, “Human Factors”
- B. Death Despite Known Drug Allergy: The Story of Zoya, Case Studies in Patient Safety, JJohnson, HHaskell, PBarach, 2016
- C. Not for IV Use: The Story of an Enteral Tubing Misconnection, Case Studies in Patient Safety, JJohnson, HHaskell, PBarach, 2016

III. Local experiences

- A. Lay examples:
 - 1. You and a friend are at the local diner during peak hours for dinner. You order the same steaks as a nearby table. You take a few bites and realize the steak is well done when your specific request was for medium rare. Who is to blame? What could be done to improve the accuracy of the process? How would improvements impact customer satisfaction? The cost to the restaurant?
 - 2. A couple with young children is at a busy airport waiting in a common waiting area for a flight to board. There are frequent announcements and noise level is high. They request an update at the desk when boarding time has passed without an update only to hear that a gate change was announced and they have now missed the flight. How could this happen? Is it amenable to a process improvement?
 - 3. You are filling out paperwork on an apartment lease. You are under time pressure to dial in for a phone meeting and do not pay attention to the fine print. Later you realize that monthly services you thought were included in rent will need to be paid by you. Why did you miss this important feature of the lease? Will this have short or long term consequences?
- B. Clinical examples
 - 1. A nurse on an understaffed unit is rushing from patient to patient to pass morning

- meds. Insulin is available on the units in multidose vials and the nurse administers pre-breakfast short acting insulin and then realizes that this patient is NPO for a procedure. What system factors played a role in this error? How would HFE interventions be effective to mitigate error?
2. A pharmacist makes a.m. work rounds with a medical service. It is reported out that the daily dose of anticoagulant was missed the day prior due to missed lab draw for PT/INR when a new phlebotomy trainee was unable to obtain a sample. Is any individual at blame? Who suffers the consequence? How could HFE make the process better?
 3. A young woman is admitted in labor to L&D. She is strep B + and will require a pre-delivery dose of Penicillin. She has also discussed epidural anesthesia for this delivery. Both the antibiotic and epidural analgesic arrive from pharmacy to the nurse's station in clear 50 cc mini IV bags. What are the concerns? What HFE approaches could be employed to reduce medical error?

IV. Online resources

- A. SEIPS - <https://cqpi.wisc.edu/research/health-care-and-patient-safety-seips/>
- B. IHI Modules- PS 103 Human Factors and Safety
 - a. Lesson 1: "Understanding the Science of Human Factors"; Boston, MA; Institute for Healthcare Improvement; 2018; available on www.IHI.org
 - b. Lesson 2: "Changes Based on Human Factors Design Principles"; Boston, MA; Institute for Healthcare Improvement; 2018; available on www.IHI.org
- C. WHO Patient Safety Curriculum Guide (Multi-professional) - Topic 2: Why Applying Human Factors is Important for Patient Safety pg 111-120
- D. Implementing Human Factors in Health Care: Taking further steps. Case studies and implementation tips. <https://drive.google.com/file/d/0B4dbLgB56hptekdpY0RWeHlfeVE/view>
- E. Clinical human-factors group <http://www.chfg.org>
- F. Actionable Patient Safety Solutions; Patient Safety Movement Foundation. <https://patientsafetymovement.org/apss>
 - a. Challenge 10: Prevention and Resuscitation of Inhospital Cardiac Arrest
 - b. Challenge 11: Optimizing Obstetric Safety
 - c. Challenge 14: Falls and Fall Prevention

V. Didactic resources

- A. The Washington Manual of Patient Safety and Quality Improvement, 2016, chapter 16 "Human Factors", pg 181-194
- B. Understanding Patient Safety, 3rd Edition, RWachter and KGupta, Chapter 7 "Human Factors and Errors at the Person-Machine Interface", pg121-134

VI. Supplemental readings

- A. "From Discovery to Design: the evolution of human factors in healthcare", Cafazzo JA, St-Cyr O. *Healthc Q.* 2012;15:24-9.
- B. "A Strategy for Human Factors/Ergonomics: Developing the Discipline and Profession", Dul J, et al. *Ergonomics.* 2012;55(4):377-95.
- C. "SEIPS 2.0: A Human Factors Framework for Studying and Improving the Work of

- Healthcare Professionals and Patients”, Holden RJ, et al. Ergonomics. 2013;56(11):1669-86.
- D. Wickens, C. D. (2008). Multiple resources and mental workload. Human factors, 50(3), 449-455.
- E. Rivera-Rodriguez, A. J., & Karsh, B. T. (2010). Interruptions and distractions in healthcare: review and reappraisal. BMJ Quality & Safety, 19(4), 304-312.
- F. Handbook of Human Factors and Ergonomics in Healthcare and Patient Safety, Carayon P. Human Factors and Ergonomics. Mahwah, NJ: Lawrence Erlbaum Associates; 2007; xiv: 995.
- G. Patient Safety: A Human Factors Approach, Decker S. New York, NY: CRC Press; 2011
- H. Human Factors Engineering in Patient Safety, Weinger MB. Anesthesiology. 2014; 120:801-806.
- I. Mitigating the Effects of Moral Distress. Kennedy, MS. AJN, American Journal of Nursing: February 2017 - Volume 117 - Issue 2 - p 7 doi: 10.1097/01.NAJ.0000512276.64382.5
- J. Endsley, M. R. (2016). Designing for situation awareness: An approach to user-centered design. CRC press.

Technology

A foundational domain

This domain addresses the expanding role of technology in healthcare delivery and its impact on patient safety. Focus is on the human and tech interface and knowledge, skills, attitudes, and behaviors needed to utilize technology for the benefit of safe care while recognizing rapid developments, such as artificial (augmented) intelligence, will create new opportunities and challenges.

Subdomain 1: Impact of technology on patient safety

Novice - Recognizes the utilization and impact of technology on patient care.

Examples of ways competency in this learning objective might be demonstrated:

- Following case discussion, learner reports instances of utilization of waived testing and list ways it impacts patient safety. Waived testing is point of care testing that requires quality assurance and competency demonstration at a level less rigorous than full laboratory testing.
- Following a didactic session, learner lists various roles of waived testing and impact on patient care.
- During early clinical experience, journals/records observations of clinical use of “waived testing” and its impact on patient care.
- Following a reflection on personal and professional experiences filling prescriptions, in a group exercise creates a process map of the electronic flow of prescription information from provider to pharmacist to patient’s prescription bottle or bedside nurse’s administration.
- During early clinical experience, journals/records observations of technological platforms for interprofessional communication of patient information during daily workflow.

- Recognizes management of patient safety when technology fails or is unavailable.

Advanced beginner - *Articulates* the utilization and impact of technology on patient care.

Examples of ways competency in this learning objective might be demonstrated:

- Demonstrates via role play the use of appropriate quality assurance for bedside technology to promote patients' safe care.
- Articulates after viewing a video the impact of appropriately standardized point of care testing and its contribution to medical decision making.
- Compares and contrasts in small group sessions clinical impact of waived testing with and without appropriate quality assurance standards.
- Following clinical experience, reflects on appropriate use of waived testing to promote patients' safe care.
- Following clinical experiences, reflects upon the technological facets of the medication use process.
- Following clinical experience, summarizes the benefits and opportunities for error associated with technological platforms for interprofessional communication of patient information during daily workflow.

Competent - *Values* appropriate application of technology as it promotes patients' safe care.

Examples of ways competency in this learning objective might be demonstrated:

- In clinical teams, utilizes point of care testing appropriately standardized to promote patients' safe care
- In clinical settings, proposes use of appropriate reporting systems for technology concerns to promote patients' safe care.
- In clinical settings, utilizes the electronic health record to safely prescribe, dispense, or administer a medication.
- In clinical settings, utilizes technological platforms for interprofessional communication of patient information during daily workflow.
- Following clinical work, reflects/journals on the value of a continuum of technology to promote patients' safe care.

Proficient - *Models* appropriate use of technology to promote safe care.

Examples of ways competency in this learning objective might be demonstrated:

- In clinical settings, models the appropriate use of technology to promote patients' safe care.
- Advises system adherence to the Safe Medical Device Act (SMDA) for the benefit of patient safety.

Expert - *Teaches* appropriate use of technology as it promotes patients' safe care.

Examples of ways competency in this learning objective might be demonstrated:

- Designs effective didactic educational activities to highlight the impact of technology on patient safety and appropriately assesses effectiveness of education.
- Uses patient safety videos to teach appropriate quality assurance of waived testing to promote patients' safe care.
- Creates scenarios for role play for learners to practice effective management of point of care testing to promote patients' safe care.

- Organizes interprofessional clinical simulation for learners to apply effective monitoring of the SMDA to promote patients' safe care.
- Role models for learners in real-time clinical settings the appropriate reporting of technology related safety issues to reduce medical error.
- Applies a process of ongoing self-evaluation and personal performance improvement that promotes continued learning of the impact of technology on patient safety.

Subdomain 2: Human-tech interface

Novice - *Identifies and appreciates* the role of technology as a member of the healthcare team.

Examples of ways competency in this learning objective might be demonstrated:

- Following case discussion of patient using a patient controlled analgesic pump or insulin pump, identifies technology as a member of the healthcare team.
- Following a didactic session, lists ways in which computerized order entry and bedside barcode scanning serve as members of the healthcare team.
- Following an ICU clinical experience, learner journals/records observations of bedside monitoring as a member of the healthcare team.

Advanced beginner - *Anticipates and understands* the role of technology as a member of the healthcare team.

Examples of ways competency in this learning objective might be demonstrated:

- Demonstrates via role play the use of computerized order entry as a member of the healthcare team to support patient safety.
- Compares and contrasts in small group sessions clinical cases with and without the use of technology to identify drug-drug interactions, contraindications, therapeutic duplications, allergies, compatibilities, and renal dosage adjustments as a member of the healthcare team.
- Following clinical experience, reflects on technology as a member of the healthcare team when used to correctly identify patients.
- Following viewing of a patient safety video, proposes appropriate use of clinical decision support technology as a member of the healthcare team.
- Following a didactic discussion, proposes the manifestations of alert and alarm fatigue in technological systems and the associated patient care impact.

Competent - *Values* technology as a member of the healthcare team.

Examples of ways competency in this learning objective might be demonstrated:

- In clinical teams, utilizes clinical decision support technology appropriately as a member of the healthcare team.
- In clinical settings, proposes appropriate use of computerized alerts and alarms as a member of the healthcare team to reduce medical error.
- In clinical settings, utilizes computerized order entry or bedside barcoding as a member of the healthcare team to support patient safety.
- Following clinical work, reflects/journals on the value of clinical decision support technology as a member of the healthcare team.

Proficient - *Incorporates* technology as a member of the healthcare team.

Examples of ways competency in this learning objective might be demonstrated:

- In clinical settings, models the incorporation and appropriate use of clinical decision support as a member of the healthcare team.
- In clinical settings, models appropriate review of computerized alerts when entering orders to reduce medical error.
- In clinical settings, models appropriate use of computerized order entry or bedside barcoding as a member of the healthcare team to support patient safety.

Expert - *Teaches* incorporation of technology as a member of the healthcare team.

Examples of ways competency in this learning objective might be demonstrated:

- Designs effective didactic educational activities to highlight the role of the human-tech interface in technological tools and appropriately assesses effectiveness of education.
- Uses patient safety videos to teach appropriate use of monitor alarms as a member of the healthcare team.
- Creates scenarios for role play for learners to practice effective use of monitor alarms as a member of the healthcare team.
- Organizes interprofessional clinical simulation for learners to apply effective use of bedside alarm technology as a member of the healthcare team.
- Creates IPE opportunities addressing technology in patient care.
- Provides feedback for learners in real-time clinical settings on the appropriate use of bedside monitoring technology as a member of the healthcare team.
- Role models verification that alarms on bedside equipment are on and audible to ensure technology as a member of the healthcare team.
- Applies a process of ongoing self-evaluation and personal performance improvement that promotes continued learning of the patient safety impact of the human tech interface.

Subdomain 3: Artificial (augmented) intelligence (AI)

Novice - *Discusses* evolving technology, how it will influence and impact healthcare, and provide opportunities for prevention of medical error.

Examples of ways competency in this learning objective might be demonstrated:

- Following case discussion, identifies fields of evolving technology and lists opportunities to positively impact patient safety.
- Following a didactic session, lists ways evolving technology impacts patient care and provides opportunity to prevent medical error.
- During early clinical experience, journals/records observations of evolving technology as it impacts patient care and provides opportunities for prevention of medical error.
- Lists reliable sources of AI to promote safe care.

Advanced beginner - *Analyzes* evolving technology, how it will influence and impact healthcare, and provide opportunities for prevention of medical error.

Examples of ways competency in this learning objective might be demonstrated:

- Demonstrates via role play the access of online learning as it impacts patient care and provides opportunities to prevent medical error.
- Compares and contrasts in small group sessions clinical cases demonstrating benefits of appropriate use of point of care (POC) search to advance patient care and to prevent

medical error.

- Following clinical experience, reflects on use of portable devices and resources to access clinical guidance and prevent medical error.
- Following viewing of patient safety video, proposes appropriate use of clinical decision support technology to impact patient care and prevent medical error.
- Compares and contrasts AI from both reliable and unreliable sources and how its use would impact patient safety.

Competent - Values evolving technology, how it will influence and impact healthcare, and provide opportunities for prevention of medical error.

Examples of ways competency in this learning objective might be demonstrated:

- In clinical teams, utilizes evolving technology POC data retrieval to appropriately to impact healthcare and reduce medical error.
- In clinical settings, proposes appropriate use of evolving clinical decision support technology to impact healthcare and prevent medical error.
- Following clinical work, reflects/journals on the value of AI technology to impact healthcare and provide opportunities for prevention of medical error.
- Applies AI from appropriate sources to clinical care to prevent medical error.

Proficient - Models utilization of evolving technology, as it influences and impacts healthcare and provides opportunities for prevention of medical error.

Examples of ways competency in this learning objective might be demonstrated:

- In clinical settings, models the use of evolving technology as it allows immediate access to clinical information to support patient care and prevent medical errors.
- Proposes use of reliable sources of AI for team members.

Expert - Teaches utilization of evolving technology and how it influences and impacts health care and provides opportunities for prevention of medical error.

Examples of ways competency in this learning objective might be demonstrated:

- Designs effective didactic educational activities to highlight the role of AI and appropriately assesses effectiveness of education.
- Uses patient safety videos to teach appropriate use of AI to impact patient care and prevent medical error.
- Facilitates case discussions to guide learners understanding of risks of clinical application of AI from inappropriate sources may lead to medical error.
- Creates scenarios for role play for learners to practice appropriate etiquette when using evolving technology to impact patient care and prevent medical error.
- Organizes interprofessional clinical simulation for learners to apply effective use of data searches using electronic apps to prevent medical error.
- Provides feedback for learners in real-time clinical settings on the appropriate use of provider communication technology to reduce medical error.
- Applies a process of ongoing self-evaluation and personal performance improvement that promotes continued learning of the impact of AI on patient safety.

Subdomain 4: Clinical value and limitations

Novice - Lists limitations and risks of inappropriate use of technology as it impacts patient safety.

Examples of ways competency in this learning objective might be demonstrated:

- Following case discussion of use of bedside EKG for a woman in labor, learner lists limitations and risks of inappropriate use of technology.
- Following viewing of a video involving bedside monitoring, learner describes limitations and risks of inappropriate use of technology.
- Following an early clinical experience in the outpatient lab, pharmacy, or clinic, learner journals/records potential limitations and inappropriate uses of technology that may impact patient safety.

Advanced beginner - *Differentiates* appropriate vs inappropriate use of technology as applied to specific patient populations.

Examples of ways competency in this learning objective might be demonstrated:

- Following case discussions, compares and contrasts clinical value and limitations of bedside glucose monitoring in different clinical circumstances.
- Following a didactic session, reflects on appropriate application of CT scanning for a patient with headache.
- Following a clinical encounter, learner proposes appropriate use of laboratory evaluation to advance care while maintaining patient safety.
- During small group sessions sharing clinical stories, differentiates appropriate from inappropriate use of mammography screening and its impact on patient safety.
- Following clinical experience, learner reflects on the use of personal technological devices for direct patient care and interprofessional communication and their impact on patient perceptions of care. Highlight generational variation.

Competent - *Applies* clinical understanding of appropriate use of technology while caring for a spectrum of patient populations to reduce medical error.

Examples of ways competency in this learning objective might be demonstrated:

- Utilizes telemetry reports appropriately while understanding the limit of technology to maintain patient safety.
- Applies clinical understanding of likelihood of positive testing prior to subjecting patient to a diagnostic study to reduce medical error.
- Practices restraint in lab evaluation by avoiding bundled lab order sets particularly when patient's clinical status increases likelihood of false positive results.
- Utilizes appropriately sized equipment based on patient body size and habitus to reduce medical error.
- Clinically evaluates medication utilization alerts in the electronic health record for applicability to specific patient populations.

Proficient - *Demonstrates* clinical understanding of appropriate use of technology while caring for unique patient populations to reduce medical error.

Examples of ways competency in this learning objective might be demonstrated:

- In clinical settings, models thoughtful selection of patients for whom troponin levels are appropriate to improve patient safety.
- Proposes appropriate staff requirements to monitor patients with multichannel IV pumps

to reduce medical error.

- Adapts clinical approach to ordering and application of bedside imaging based on understanding of distinct patient populations.
- In clinical settings, utilizes decision support tools to promote antimicrobial stewardship while optimizing patient care.

Expert - Teaches the role of clinical understanding of various patient populations to optimize the use of technology to advance safe care.

Examples of ways competency in this learning objective might be demonstrated:

- Designs effective didactic educational activities to highlight the clinical utility and limits to technology in professional practice.
- Uses videos of clinical scenarios to initiate discussion of limitations and potential for inappropriate use of technology and its impact on patient safety.
- Discusses in real time in clinical setting the value and limitations of technology when applied in variable patient populations.
- Reflects during peer conferences the impact on patient safety of the application of results of inappropriately used technology.
- Applies a process of ongoing self-evaluation and personal performance improvement that promotes continued learning of the clinical value and limits to technology in professional practice.

Resources

I. Videos and stories

A. Survivors

1. Michael Seres (video and written story)
2. Deann Merchant (written story, outside of the hospital setting)

B. Preventable death: Listed are patient stories in video and written form provided by the PSMF. These provide an opportunity to personalize a patient's experience and provide a learning opportunity for the student.

1. Jem Darling (video and written story)
2. Jennifer Nibarger (video and written story)
3. Chris Salazar (video and written story)
4. Lewis Blackman (video and written story)
5. Dave Bunoski (video and written story)
6. Rory Staunton (video and written story)
7. Leah Coufal (video and written story)
8. John LaChance (video and written story)
9. Pete Conrad (video and written story)
10. Alex James (written only)
11. Curtis Bentley (written only)
12. Amanda Abbiehl (written only)

C. Provider stories

1. UCSF's Success Implementing Technology to Reduce Sepsis Mortality
 2. UCSD's Success Reducing In-hospital Cardiac Arrest
 3. Data Liquidity
- D. Other relevant videos
1. The "To Err is Human" documentary (accessible via <https://www.toerrishumanfilm.com/>) provides teaching opportunities for the healthcare professional in training. The following clips are relevant to Technology:
 - a) Teodor Grantcharov M.D. 51:00-52:15
 - b) Karthik Raj 52:16-55:00

II. Clinical cases

- A. Death Despite Known Drug Allergy: The Story of Zoya, Case Studies in Patient Safety, JJohnson, HHaskell, PBarach, 2016.

III. Local experiences

- A. Lay examples:

1. You arrive at the local ATM for cash withdrawal after hours and it is out of order. Did you over rely on this technology? How did over reliance impact your plans for the evening?
2. There is severe weather expected in your area in the middle of the night. The regional National Weather Service is set up to send alerts by cell and landlines to the population. Alerts are automated to be sent every 15 min across the population. You are trying to sleep. How do you respond to multiple alerts? You feel this alert is not applicable to your locale. How do you react to the alerts?
3. You are driving to a new destination and are using GPS technology to find it. How would this experience be different in the "old days"?

- B. Clinical examples:

1. An inpatient being treated for dehydration is receiving IV fluid by IV pump and is adjusted by nursing staff according to physician orders. How does technology impact care?
2. A complex patient in a critical care setting requires artificial ventilation, IV fluid, vasopressors, antibiotics, monitoring of vital signs, and oximetry. Patient restlessness triggers frequent alarms. How does technology impact the quality of care for this patient? How does technology serve as a member of the care team? How might technology be detrimental to this patient's care?
3. Your health systems electronic health record (EHR) is unexpectedly down. Consider the value and limitations of EHR technology in patient care.
4. Bedside glucose testing is done without proper quality assurance of the equipment giving an inaccurate result. The patient's insulin dose is given according to the test result. Consider the value and limitation of technology in this case.
5. New technology allows for patients to purchase a limited genetically based "health profile".
6. Hospitals are increasingly tasked with implementing technological safeguards to safely store and account for opioid medications to prevent diversion. How does the insertion of technology impact the workflow at the bedside? In the operating room?

7. A patient is being discharged after admission for sepsis secondary to an infected renal stone. An electronic prescription for sulfamethoxazole-trimethoprim is sent to her pharmacy. Upon review of daily labs, her serum creatine isn't trending down sufficiently and the team elects to delay discharge. The next morning, the patient is ready for discharge and the new service team electronically prescribes ciprofloxacin, a less nephrotoxic antimicrobial. The patient arrives at the pharmacy, purchases, and takes both medications. How did technology impact care?

IV. Online resources

- A. IHI Patient Safety 103, lesson 3 "Using Technology to Mitigate the Impact of Medical Error"; Boston, MA; Institute for Healthcare Improvement; 2018; available on www.IHI.org
- B. Telehealth and Patient Safety- <https://mhealthintelligence.com/news/7-tips-for-including-patient-safety-in-telemedicine-programs>

V. Didactic resources

- A. *The Washington Manual of Patient Safety and Quality Improvement*, 2016, Chapter 7, "Healthcare Information Technology (Clinical Decision Support Systems, HIT and Adverse HIT Events)
- B. *Understanding Patient Safety*, 3rd Edition, RWachter and KGupta, Chapter 13 "Information Technology"

VI. Supplemental reading

- A. The vulnerabilities of computerized physician order entry systems: a qualitative study. Slight SP, *J Am Med Inform Assoc* 2016; 23: 311-316
- B. State of Telehealth. Dorsey ER, *NEJM* 2016; 375: 154-161
- C. Predicting the future-big data, machine learning, and clinical medicine. Obermeyer Z, *NEJM* 2016; 375: 1216-1219
- D. *The Patient Will See You Now: The Future of Medicine is in Your Hands*. New York, NY: Basic Book. 2015.

Teamwork and communication

A linking domain

This domain addresses the concept of teams in healthcare delivery and emphasizes the knowledge, attitudes, skills, and behaviors required of effective teams to deliver safe care. Error prone "gaps" in care are highlighted with content offering validated communication frameworks to ensure patients' safe transitions across the health care experience.

Subdomain 1: "Teams" in healthcare

Novice - Recognizes the benefits of effective interprofessional teams and their role in patient safety.

Examples of ways competency in this learning objective might be demonstrated:

- Following discussion of case studies, learner identifies benefits of interprofessional teams in patient care.
- Following a didactic session, lists essential characteristics of highly functioning

interprofessional teams, emphasizing mutual respect, shared values, and psychological safety.

- Following a didactic session, lists benefits of interprofessional teams in patient care.
- After viewing a video depicting consequences of medical error, reflects on areas of opportunity for improvement linked to benefits of interprofessional teams in patient care.
- Following observation in a clinical setting, can report out the benefits of interprofessional teams in patient care.
- Following observation in a clinical setting (acute care, chronic care, outpatient, pharmacy, etc.), reports on appropriate inclusion of patient and family as a member of the team.

Advanced beginner - *Articulates* the benefits of effective interprofessional teams and their role in patient safety.

Examples of ways competency in this learning objective might be demonstrated:

- Following a case study, learner articulates the reasons for including the patient and interprofessional colleagues as active members of the patient care team.
- Following role play as a patient or member of an interprofessional clinical team, proposes benefits of interprofessional teams to deliver safe care.
- Following a clinical experience, compares and contrasts in small group discussion observations of an interprofessional team and patient as team member as it benefits patient care.

Competent - *Values* the benefits of effective interprofessional teams and their role in patient safety.

Examples of ways competency in this learning objective might be demonstrated:

- Actively participates as a member of an interprofessional team and includes patient input in the clinical setting for the benefit of patient care.
- Incorporates patients and families and others into the interprofessional team to benefit patient care.
- Demonstrates respect for the contributions of all team members, including the patient, in the clinical setting to benefit patient care.
- Communicates with patients, families, communities, and other health professionals in a responsive and responsible manner that supports a team approach to the maintenance of health and treatment of disease.
- Uses the knowledge of one's own role and those of other professions to appropriately assess and address the healthcare needs of the patients and populations served.

Proficient - *Models* the benefits of effective interprofessional teams and their role in patient safety.

Examples of ways competency in this learning objective might be demonstrated:

- When leading a clinical team, models interaction with patients as a member of an interprofessional team to benefit patient care.
- When leading a clinical team, models respect for all members and their contributions to the interprofessional team to benefit patient care.
- Reflects on clinical care experience and proposes creation of interprofessional teams that include patients and families to benefit patient care.

Expert - *Teaches* the role of effective interprofessional teams and their role in PS.

Examples of ways competency in this learning objective might be demonstrated:

- Designs effective didactic educational activities to highlight key characteristics and benefits of interprofessional teams and appropriately assesses effectiveness of education.
- Utilizes videos to teach how interprofessional teams and inclusion of patient voice benefit patient care.
- Develops role playing scenarios to teach how interprofessional teams that include patients benefit patient care.
- Coordinates interprofessional clinical simulations to teach benefits of the interprofessional team to patient care.
- Offers formative feedback in clinical settings to learners who are developing interprofessional team skills.
- Applies a process of ongoing self-evaluation and personal performance improvement that promotes continued learning of team science.

Subdomain 2: Handoffs and gaps; TeamSTEPPS

Novice - *Recognizes* the value of appropriate communication as it promotes information exchange to ensure patients' safe transitions across the healthcare system.

Examples of ways competency in this learning objective might be demonstrated:

- Following case discussion, learner identifies effective communication as it promotes patients' safe transitions across the healthcare system.
- Following a didactic session, lists/performs "teach back" of accepted frameworks for effective communication as it promotes patients' safe transitions across the healthcare system.
- During early clinical experience, journals/records observations of clinicians' use of appropriate communication as it promotes patients' safe transitions across the healthcare system.
- During early clinical experiences, journals/records observations of a medication reconciliation encounter with a patient (office visit, admission, or discharge).
- During early clinical experience, observes the incorporation of patient and family into information exchange to ensure safe transitions of care.

Advanced beginner - *Articulates* the value of appropriate communication as it promotes information exchange to ensure patients' safe transitions across the healthcare system.

Examples of ways competency in this learning objective might be demonstrated:

- Demonstrates via role play the use of effective communication as it promotes patients' safe transitions across the health system.
- Compares and contrasts in small group sessions clinical cases efficacy of communication involving patient and family to promote patients' safe transitions across the health system.
- Following clinical experience, reflects on use of effective communication to promote patients' safe transitions across the health system.
- Following viewing of patient safety video, proposes use of appropriate communication to promote patients' safe transitions across the health system.
- Following case discussions of admission and discharge medication reconciliation encounters, articulates key elements of successful medication information exchange to

ensure a safe care transition.

Competent - *Values* appropriate communication as it promotes information exchange to ensure patients' safe transitions across the healthcare system.

Examples of ways competency in this learning objective might be demonstrated:

- In clinical teams, utilizes appropriate communication to promote patients' safe transitions across the health system.
- In clinical settings, proposes use of appropriate communication that includes patient and family to promote patients' safe transitions across the health system.
- In clinical settings, communicates effectively with interprofessional team to anticipate and address barriers to safe and effective care transitions across the health system
- Following clinical work, reflects/journals on the value of group communication to promote patients' safe transitions across the health system.

Proficient - *Models* appropriate communication as it promotes information exchange to ensure patients' safe transitions across the healthcare system.

Examples of ways competency in this learning objective might be demonstrated:

- In clinical settings, models the use of appropriate communication to promote patients' safe transitions across the health system.
- In clinical settings, models the incorporation of patient and family into the communication process to promote patients' safe transitions in care.
- During peer and interprofessional meetings, proposes appropriate communication formats that include patient and family to promote patients' safe transitions in care.
- Following clinical shift, reflects on appropriate use of communication with interprofessional team and patient/family to promote safe transitions in care.

Expert - *Teaches* appropriate communication as it promotes information exchange to ensure patients' safe transitions across the healthcare system.

Examples of ways competency in this learning objective might be demonstrated:

- Designs effective didactic educational activities to highlight key characteristics of successful communication and appropriately assesses effectiveness of education.
- Uses patient safety videos to teach appropriate communication to promote patients' safe transitions across the health system.
- Creates scenarios for role play for learners to practice use of effective communication to promote patients' safe transitions across the health system.
- Organizes interprofessional clinical simulation for learners to apply effective communication to promote patients' safe transitions across the health system.
- Provides feedback for learners in real-time clinical settings on use of appropriate interprofessional communication that includes patient and family to promote patients' safe transitions across the health system.
- Applies a process of ongoing self-evaluation and personal performance improvement that promotes continued learning of methodology for highly effective communication.

Materials for role play

- To access role play materials related to "Handoff" - <http://patient.sm/role-play-handoff>

- TeamSTEPPS communication- TeamSTEPPS 2.0- <https://www.ahrq.gov/teamstepps/curriculum-materials.html>
- CUSP Toolkit- <https://www.ahrq.gov/professionals/education/curriculum-tools/cusptoolkit/index.html>

Resources

I. Videos and stories

- A. Survivors
 - 1. Alicia Cole (video and written story)
- B. Preventable death: Listed are patient stories in video and written form provided by the PSMF. These provide an opportunity to personalize a patient’s experience and provide a learning opportunity for the student.
 - 1. Jennifer Nibarger (written & video)
 - 2. Jem Darling (written & video)
 - 3. Bill Aydt (written & video)
 - 4. Rory Staunton (written & video)
 - 5. Kristen Terlizzi (written & video)
 - 6. Joan Donnelly (written & video)
 - 7. Mary Scarlata (written only)
- C. Provider stories
- D. Other relevant videos
 - 1. The “To Err is Human” documentary (accessible via <https://www.toerrishumanfilm.com/>) provides teaching opportunities for the healthcare professional in training. The following clips are relevant to Teamwork:
 - a) Boaz Keysar 7:16 -7:31

II. Clinical cases

- A. Unmonitored: A Postsurgical Narcotic Overdose in the Hospital (Louise Batz Story); Case Studies in Patient Safety, JJohnson, HHaskell, PBarach, 2016
- B. Not Considered a Partner: A Mother’s Story of a Tonsillectomy Gone Wrong (Noah Lord Story); Case Studies in Patient Safety, JJohnson, HHaskell, PBarach, 2016

III. Local experiences

- A. Lay examples
 - 1. How does teamwork and communication impact the efficiency and accuracy of your local fast food restaurant? The record of your favorite sports team?
 - 2. How does a shared understanding of communication (signage) provide for safe driving?
- B. Clinical examples
 - 1. You get a blood test. How does teamwork facilitate your experience? Communication?
 - 2. A patient arrives for an office appointment. What is the role of teamwork and communication here? In the ED? In the pharmacy?
 - 3. A hospitalized patient becomes unstable. How does teamwork and communication

successfully impact the care of the patient? Consequences of suboptimal teamwork and communication?

4. A patient arrives in the OR for an elective cholecystectomy. What role do teamwork and communication play in the care of this patient? What are the consequences of failed teamwork and communication?
5. Consider the 911 system for a medical emergency. What is the impact on patient outcomes if teamwork and communications fail? Discuss the role of each person involved in the 911 response system? (Operator, Dispatcher, Police, Fire/EMS, ED RN/MD/support staff, OR, Lab, Radiology, Blood Bank, IT (EHR), ICU, etc.)
6. A patient being discharged from the hospital is given a new prescription for metformin. The patient was given IV contrast 24 hours prior, which is a contraindication to metformin administration. How can interprofessional communication be improved to prevent medication errors during hand-offs?

IV. Online resources

- A. Institute for Healthcare Improvement (IHI) Open School: Patient Safety Series, PS Module 104
 1. Lesson 1-Why are Teamwork and Communication Important
 2. Lesson 3-Basic Tools and Techniques for Effective Communication
- B. Patient Safety Movement Foundation "Actionable Patient Safety Solutions" <https://patientsafetymovement.org/apss>.
 1. APSS #1: Creating a Culture of Safety
 2. APSS #6: Hand-off Communications
 3. APPS #16: Person & Family Engagement

V. Didactic resources

- A. WHO Multi-professional Patient Safety Curriculum Guide, Part B, Topic 4: Being an Effective team player
 1. Handouts-
 - Being an effective team player: https://www.who.int/patientsafety/education/curriculum/course4_handout.pdf?ua=1
 - Being an effective team player: https://www.who.int/patientsafety/education/curriculum/PSP_mpc_topic-04.pdf?ua=1
 - Understanding and managing clinical risk: https://www.who.int/patientsafety/education/curriculum/course6_handout.pdf?ua=1
 - Engaging with patients and carers: https://www.who.int/patientsafety/education/curriculum/course8_handout.pdf?ua=1
 - Improving medication safety: https://www.who.int/patientsafety/education/curriculum/course11_handout.pdf?ua=1
 2. Powerpoint teaching slides-
 - Being an Effective Team Player: http://www.who.int/patientsafety/education/mp_curriculum_tools/en/index4.html
 - Understanding and managing clinical risk: https://www.who.int/patientsafety/education/curriculum/PSP_mpc_topic-06.pdf?ua=1

Engaging with patients and carers: https://www.who.int/patientsafety/education/curriculum/PSP_mpc_topic-08.pdf?ua=1

Improving medication safety: https://www.who.int/patientsafety/education/curriculum/PSP_mpc_topic-11.pdf?ua=1

- B. *The Washington Manual of Patient Safety and Quality Improvement*, 2016, chapter 15 "Teamwork and Communication"
- C. *Understanding Patient Safety*, 3rd Edition, RWachter and KGupta, Chapter 9 "Teamwork and Communication Errors"

VI. Supplemental readings

- A. "Speaking up for patient safety by hospital-based healthcare professionals: a literature review". Okuyama A. *BMC Health Serv Res* 2014;14;61
- B. "Speaking up- when doctors navigate medical hierarchy". Srivastava R. *NEJM* 2013; 368:302-305.
- C. "Improving teamwork in healthcare: current approaches and the path forward." Thomas E. *BMJ Qual Saf* 2011;20:647-650.
- D. "The Joint Commission Guide to Improving Safe Communication", Joint Commission, *Joint Commission Resources*; 2008

Leadership and leading change

A linking domain

This domain emphasizes the critical role of leadership amongst team members, and at all levels of health systems, as well as the knowledge, skills, attitudes, and behaviors needed to effect meaningful changes to deliver safe care.

Subdomain 1: Role of leadership in patient safety

Novice - Recognizes the responsibility of every healthcare professional to influence change to reduce medical error.

Examples of ways competency in this learning objective might be demonstrated:

- Following a didactic presentation on error science, learner teaches back for small group ways in which physicians, nurses, pharmacists, therapists, and other healthcare professionals can act to reduce medical error.
- Following a case discussion involving medical error, learner lists opportunities for individual action by a healthcare professional to improve case outcome.
- Following observation in a clinical setting (ED, ward, office, pharmacy, extended care, etc.), learner reports back actions taken by individual healthcare professionals demonstrating intent to reduce medical error.
- Following a conversation with a patient or family member regarding an experience in the healthcare system, learner identifies actions taken by providers to reduce medical error.

Advanced beginner - Describes impact of healthcare professionals' responsibility to influence change to reduce medical error.

Examples of ways competency in this learning objective might be demonstrated:

- Following a small group case discussion involving medical error, learner compares and

contrasts actions taken by healthcare professions and describes impact of influencing change to reduce medical error.

- Following a shift in a clinical setting (ED, Pharmacy, ward, office, etc.), learner reflects on how to improve their own actions to influence change and reduce medical error.
- Following an interview with a patient or family describing a clinical experience, learner proposes effective individual behavior that will influence change to optimize patient safety.
- Participates in role-play scenarios to practice effective personal actions that can influence change to reduce medical error.

Competent - *Attaches* value to one's own responsibility to influence change to reduce medical error.

Examples of ways competency in this learning objective might be demonstrated:

- Reflects in action to ensure responsible behavior to influence change to reduce medical error.
- Incorporates patient and family in intentional behaviors to influence change and reduce medical error.
- Follows up on a clinical interaction where personal responsibility to influence change and reduce medical error was lacking.

Proficient - *Models* ownership of responsibility to influence change to reduce medical error.

Examples of ways competency in this learning objective might be demonstrated:

- During work rounds with team, models intentional behavior to influence change to reduce medical error by taking time to clarify medication question with pharmacy.
- During peer committee meeting, proposes addition of interprofessional members to influence change to reduce medical error.
- During conversation with other healthcare team members, demonstrates commitment to influence change to reduce medical error by incorporating patient and family as team members.

Expert - *Leads* via encouragement of all team members to fulfill responsibility to influence change to reduce medical error.

Examples of ways competency in this learning objective might be demonstrated:

- During work rounds, gives in the moment feedback to team members to improve their behaviors to actively influence change to reduce medical error.
- During committee meeting discussing case of medical error, teaches peers the opportunities for individual team members to act to influence change and reduce medical error.
- Prepares and supervises role play for learners to gain skill in acting effectively to influence change and reduce medical error.
- Uses video demonstrating medical error to prompt small group discussion for novice learners to identify opportunities for individual action to influence change and reduce medical error.

Subdomain 2: System engagement (board to frontline)

Novice - *Recognizes* the need for ownership of the culture of safety across diverse members of the healthcare system to ensure delivery of safe care.

Examples of ways competency in this learning objective might be demonstrated:

- Following case discussion involving medical error, learner identifies gaps in ownership of the culture of safety across members of the healthcare system (board to front line) to failed delivery of safe care.
- Following a didactic session on culture of safety, learner lists members of healthcare system who need to take ownership of such a culture to ensure delivery of safe care (board to frontline).
- Following a conversation with a patient and family regarding an experience in the healthcare system, learner reports back regarding opportunities for ownership of culture of safety by diverse members of that system to reduce medical error.
- Following observation in an interprofessional setting (pharmacy, ED, ward, office, etc.), learner journals on individuals' actions demonstrating ownership of the culture of safety intended to ensure delivery of safe care.

Advanced beginner - *Reflects* on the impact of ownership of the culture of safety across diverse members of the healthcare system as it ensures delivery of safe care.

Examples of ways competency in this learning objective might be demonstrated:

- Compares and contrasts in small group discussion the potential outcome of a clinical scenario with and without individual ownership of the culture of safety across diverse members (board to frontline) of the healthcare system.
- Following an interprofessional clinical shift (pharmacy, ED, ward, office, etc.), reflects on diverse members of the healthcare system successes at demonstrating ownership of the culture of safety to deliver safe care.
- Following a discussion with a patient and family regarding a suboptimal experience in the healthcare system, learner journals potential changes for diverse members of the system (board to frontline) that would demonstrate ownership of the culture of safety and ensure delivery of safe care.
- Participates in interprofessional role play scenario (patient picking up medication at pharmacy, arriving for same day surgery, seen in ED for chest pain, in gym for PT for total knee replacement) to develop skill of demonstrating ownership of culture of safety as a member of the healthcare team to ensure delivery of safe care.

Competent - *Attaches* value to the shared ownership of the culture of safety across diverse members of the healthcare system as it ensures delivery of safe care.

Examples of ways competency in this learning objective might be demonstrated:

- Following a clinical interaction, attaches value to the contribution of other members of the healthcare system in their shared ownership of the culture of safety to ensure delivery of safe care.
- Ensures inclusion of patient and family as owners of the culture of safety in daily clinical interactions to ensure delivery of safe care.
- Reflects in action during a clinical shift (pharmacy, PT gym, ED, ward, office) on personal role in cultivating shared ownership of the culture of safety across diverse members of the healthcare team to ensure delivery of safe care.

Proficient - *Models* adherence and support of the shared ownership of the culture of safety across diverse members of the healthcare team to ensure delivery of safe care.

Examples of ways competency in this learning objective might be demonstrated:

- Models inclusion of voice of interprofessional team and patient and family in care of patient receiving inpatient care to ensure shared ownership of the culture of safety to ensure delivery of safe care.
- Proposes empowering non-clinical workers in the healthcare system to share ownership of the culture of safety to ensure delivery of safe care.
- Models respect for the work of all individuals in the clinical space as they demonstrate ownership in the culture of safety to ensure delivery of safe care.
- Proposes administrative representation on periodic clinical rounds, clinical committee meetings, and staff huddles to promote shared ownership of the culture of safety to ensure delivery of safe care.

Expert - Teaches benefits of shared ownership of the culture of safety across diverse members of the healthcare system to ensure delivery of safe care.

Examples of ways competency in this learning objective might be demonstrated:

- Teaches learners through case discussions involving medical error the benefits of shared ownership of the culture of safety across diverse members of the healthcare system to ensure delivery of safe care.
- During work rounds, gives in the moment feedback to reinforce behavior of a non-clinical employee demonstrating ownership of the culture of safety.
- Leads interprofessional committee meeting and obtains input from all members to ensure shared ownership of the culture of safety across diverse members of the healthcare system to ensure delivery of safe care.
- Participates actively in clinical leadership and administrative meetings to ensure shared ownership of the culture of safety across clinical and administrative members of the healthcare system to ensure delivery of safe care.
- Teaches patients and families their role in the shared ownership of the culture of safety while working with clinical team (ward, office, pharmacy, PT department, etc).

Role play materials

- To access role play materials related to "Leading Change in Patient Safety" - <http://patient.sm/role-play-leadership>

Resources

I. Videos and Stories

A. Survivors

a. Jack Gentry (video)

B. Preventable deaths: Listed are patient stories in video and written form provided by the PSMF. These provide an opportunity to personalize a patient's experience and provide a learning opportunity for the student.

1. Pete Conrad (video and written story)

2. Josh Barron (video and written story)

3. Josie King (written story)

C. Provider stories

D. Other relevant videos

1. The “To Err is Human” documentary (accessible via <https://www.toerrishumanfilm.com/>) provides teaching opportunities for the healthcare professional in training. The following clips are relevant to Leadership:
 - a. Lucian Leape M.D. 11:35 - 12:00
 - b. Don Berwick M.D. 33:00 - 33:31
 - c. Michael Millenson 11:20-11:32

II. Clinical cases

III. Local experiences

IV. Online resources

- A. APSS #1: Creating a Culture of Safety
- B. IHI Open School
 1. QI 105 Leading Quality Improvement; Boston, MA. Institute for Healthcare Improvement, 2016; available on www.ihl.org
 2. Lesson 2: “Change Psychology and the Human Side of Quality Improvement”
 3. QI 201 Planning for Spread: From Local Improvement to System -Wide Change; Boston, MA; Institute for Healthcare Improvement, 2016; available on www.IHI.org
 - a. Lesson 1: “How Change Spreads”
 - b. Lesson 2: “Tactics for Spreading Change”
 - c. Lesson 3: “Case Study in Spreading Innovation: Transforming Care at the Bedside”
 4. PS 202 Building a Culture of Safety; Boston, MA. Institute for Healthcare Improvement; 2016; available on www.IHI.org
 - a. Lesson 1: “Leading Healthcare Systems through Adverse Events”
 - b. Lesson 3: “Tactics for Leading Cultural Change”
 5. Leadership 101 Introduction to Healthcare Leadership; Boston, MA; Institute for Healthcare Improvement; 2016; available at www.ihl.org
 - a. Lesson 1: “What Makes a Leader?”
 - b. Lesson 2: “Practical Skills for Leading Teams”
 - c. Lesson 3: “Strategies to Sustain your healthcare Leadership Journey”

V. Didactic resources

- A. *Understanding Patient Safety*, 3rd Edition, RWachter and KGupta, Chapter 22 “Organizing a Safety Program”; pages 420-436

VI. Supplemental reading

- A. Briddon M, Strang C, Berwick DM. Invite the next generation to lead. *Healthcare Executive*. 2018 Sept;33(5):72-73.
- B. Botwinick L, Bisognano M, Haraden C. *Leadership Guide to Patient Safety*. IHI Innovation Series white paper. Cambridge, MA: Institute for Healthcare Improvement; 2006. (Available on www.IHI.org)
- C. *Leading a Culture of Safety: A Blueprint for Success*. American College of Healthcare Executives and IHI/NPSF Lucian Leape Institute. Boston, MA: American College of

Healthcare Executives and Institute for Healthcare Improvement; 2017.

D. Gandhi TK. Leadership and vision for a culture of safety. *NEJM Catalyst*. February 8, 2018.

Culture of safety

An aspirational domain

This domain compares and contrasts the current culture of healthcare with an ideal culture that would promote patient safety. It addresses elements of organizational culture, professionalism, ethics, disclosure, and “care for the caregiver” including the knowledge, skills, attitudes, and behaviors required to develop a “culture of safety” and an effective learning system.

Subdomain 1: Landscape of healthcare and how we got here; history and epidemiology of medical error; just culture

Novice - *Recalls* the factors that influence patient safety in healthcare delivery.

Examples of ways competency in this learning objective might be demonstrated:

- Following reading assignment, learner describes changes in healthcare delivery with respect to model of care delivery.
- Following didactic session, reports back on landmark publications bringing medical error and need for improved patient safety to national attention.
- Following viewing of video, lists characteristics of just culture.
- Following observation in the clinical space, learner journals on elements of just culture in action.
- Following case discussion, learner identifies how changes in healthcare delivery have impacted patients and families undergoing care.
- Following a didactic session, learner recalls impact on changing models of care delivery on need for interprofessional approach to care.

Advanced beginner - *Analyzes* factors that influence patient safety in healthcare delivery.

Examples of ways competency in this learning objective might be demonstrated:

- In small group, discusses how changes in healthcare delivery have impacted patient safety with respect to communication with patients and families and clinical team members.
- Compares and contrasts integrated healthcare system vs independent entities on the impact of patient safety for patients undergoing diagnostic testing.
- Reflects on one’s role and responsibility to support just culture after a clinical experience in an interprofessional setting.
- Presents to peers lessons learned from a personal or family member experience recommending specific alterations to a clinical setting to reflect just culture.
- Draws conclusions in small group setting role regarding need for patient and family voice in the healthcare process in contemporary healthcare delivery.
- Following a case discussion, analyzes by journaling the impact of incorporating interprofessional teams in the contemporary healthcare process to reduce medical error.

Competent - *Navigates* effectively factors that influence patient safety in healthcare delivery.

Examples of ways competency in this learning objective might be demonstrated:

- During a clinical experience, applies understanding of impact on patient and family vulnerability created by contemporary healthcare delivery.
- During medication processing (ordering, filling, reconciliation), displays awareness of high error potential.
- During interprofessional interactions, behaves appropriately to maintain an atmosphere of just culture.
- Attaches value to incorporation of patient and family voice in decision making as a priority based on understanding of epidemiology of medical error.

Proficient - Models effective navigation of the factors that influence patient safety in healthcare delivery.

Examples of ways competency in this learning objective might be demonstrated:

- During a clinical experience, models education of patient and family to reduce their vulnerability created by contemporary approaches to healthcare delivery.
- During peer meetings, shows consideration for applying extra attention to high risk clinical processes based on understanding of epidemiology of medical error.
- Actively models a behavior to support just culture in interprofessional settings.
- Proposes during administrative and staff meetings the need to reliably incorporate patient and family voice in clinical decision making.

Expert - Teaches effective navigation of factors that influence patient safety in healthcare delivery.

Examples of ways competency in this learning objective might be demonstrated:

- Develops curricular materials to teach learners the impact of changes in healthcare delivery on patients, families, and medical error risk.
- Teaches during peer committee work the benefit of maintaining just culture to reduce medical error.
- Leads initiative to include patient and family voice in clinical documentation.
- Gives feedback to interprofessional team members on their performance in creating and maintaining just culture.

Subdomain 2: Organizational culture; learning systems; rewarding just culture and maintaining momentum

Novice - Recognizes the role of organizational culture and its impact on promoting safe patient care by all healthcare team members.

Examples of ways competency in this learning objective might be demonstrated:

- Following a didactic lesson, learner lists aspects of organizational culture that promote safe care.
- Following a case discussion involving recognition of medical error and subsequent system response, learner recalls benefits of just culture.
- In small group discussion, learner recognizes the positive effect of actively rewarding just culture on maintaining that clinical atmosphere.
- Following a didactic session, learner describes characteristics of learning systems.

Advanced beginner - Understands the role of organizational culture and its impact on

promoting safe patient care by all healthcare team members.

Examples of ways competency in this learning objective might be demonstrated:

- Following case discussion involving medical error, learner compares and contrasts characteristics of organizational culture that promote positive vs negative work environments.
- Following attendance at an M&M conference, learner reflects on how systems evolve based on lessons learned.
- Following a clinical encounter, learner predicts positive impact of rewarding just culture on patient safety.
- Following attendance at a patient safety committee meeting, learner draws conclusions regarding application of medical error and near misses on healthcare as a learning system.

Competent - Values the role of organizational culture and its impact on promoting safe patient care by all healthcare team members.

Examples of ways competency in this learning objective might be demonstrated:

- Performs in clinical settings with interprofessional colleagues to reflect mission of organizational culture.
- Participates in feedback surveys to enhance understanding of system characteristics and opportunity for improvement.
- When receiving a call from pharmacy regarding a medication order, practices with an attitude of just culture.
- Cooperates as requested on review of clinical performance to benefit patient outcomes by supporting a learning system.
- Values role of one's own contribution to maintaining momentum of just culture.

Proficient - Models the role of organizational culture and its impact on promoting safe patient care by all healthcare team members.

Examples of ways competency in this learning objective might be demonstrated:

- Models in departmental meetings characteristics of organizational culture that support organization's mission.
- Proposes changes to system processes based on data collected by patient safety and QI teams to reflect a learning system and reduce medical error.
- Shares stories in peer meetings that reflect just culture with the intent to maintain that momentum.
- Shows sensitivity and respect in interprofessional settings for contributions of group members.

Expert - Teaches the role of organizational culture and its impact on promoting safe patient care by all healthcare team members.

Examples of ways competency in this learning objective might be demonstrated:

- Teaches by presenting didactic sessions characteristics of organizational culture and learning systems.
- Leads interprofessional team to recommend system modifications based on patient

safety and QI data collection to improve patient safety.

- Encourages broad participation in interprofessional settings designed to provide feedback regarding organizational culture.
- Gives feedback to participants in M&M conference speaking frankly and respectfully regarding participants in the patient's care to maintain momentum of just culture.
- Engages in lifelong learning and education around patient safety best practices.

Subdomain 3: Professionalism and ethics; disclosure; care for the caregiver

Novice - *Recognizes* expectations of individual team members with regards to professionalism as it contributes to a culture of safety.

Examples of ways competency in this learning objective might be demonstrated:

- Following a didactic session, learner recalls societal expectations of the healthcare professional.
- Following a case discussion involving end of life care, learner recognizes potential for "moral distress" when personal ethics and system requirements do not align.
- Following a video demonstrating disclosure of medical error by clinician to patient and family, learner identifies what was done well and was effective.
- Following an assigned reading, learner describes the AHRQ CANDOR approach to disclosure.
- Following a video demonstrating the difficulties faced by a provider following medical error, learner recalls the need to provide system support for "care for the caregiver".

Advanced beginner - *Anticipates* expectations of individual team members with regards to professionalism as it contributes to a culture of safety.

Examples of ways competency in this learning objective might be demonstrated:

- Following viewing of mock clinical videos that reflect presence or lack of professionalism, learner reflects on the implications of professionalism for patient safety.
- Following case discussion involving medical error in small group setting, learner proposes and approach to disclosure of error to patient and family.
- Following a clinical experience where lack of professionalism was displayed by a senior clinician, learner reflects on why the clinician reacted this way and how this reaction might be avoided.
- Following case discussion of end of life care, learner interprets conflict between ethical position and system requirement leading to "moral distress".
- Following case discussion involving medical error in small group setting, learner compares and contrasts potential outcomes with and without disclosure of error to patient and family.
- Following interprofessional simulation activity to apply CANDOR approach of error disclosure, learner receives feedback on process and demonstrates improvement on repeat attempt.
- Following attendance at M&M conference of case involving medical error, learner articulates the type of system support needed for "care for the caregiver".

Competent - *Values* expectations of individual team members with regards to professionalism as it contributes to a culture of safety.

Examples of ways competency in this learning objective might be demonstrated:

- Following a clinical experience that required error disclosure, reflects back on what went well and how it could be improved.
- Following discussion of error during a peer committee meeting, questions whether disclosure was adequately addressed.
- Stays motivated to maintain high level of professionalism in all clinical settings especially during challenging clinical encounters.
- Shares ethical explanations with patients and families to better inform their decision making in end of life care and minimize “moral distress”.
- Utilizes CANDOR approach to error disclosure to ensure high quality of communication.
- Participates in system recommended “care for the caregiver” support for colleagues involved in cases of medical error.

Proficient - *Integrates* expectations of individual team members with regards to professionalism as it contributes to a culture of safety.

Examples of ways competency in this learning objective might be demonstrated:

- Models consistently professional behavior especially in difficult clinical encounters.
- Justifies in peer group meetings the validity of “moral distress” and its impact on patient safety.
- Models CANDOR approach to error disclosure for clinical team during bedside conversation.
- Demonstrates respect for ethical position of patients and families.
- Values the study of ethics and its application to healthcare.
- Models participation in system recommended “care for the caregiver” support for a colleague involved in a case with medical error.

Expert - *Teaches* respect and integration of expectations of individual team members with regards to professionalism as it contributes to a culture of safety.

Examples of ways competency in this learning objective might be demonstrated:

- Teaches by preparing didactic materials containing societal expectations for professionalism in healthcare.
- Teaches on clinical rounds the role of ethics in everyday clinical care.
- Gives formative feedback to others developing skills in CANDOR formatted disclosure.
- Actively supports an interprofessional colleague acknowledging moral distress following the death of a patient.
- Leads interprofessional group to provide health system employees education on the benefits to patient and family, clinician, and system of appropriate disclosure of medical errors.
- Trains colleagues via role play appropriate system recommended “care for the caregiver” support for clinicians involved in a case of medical error.

Role play materials

- To access role play materials related to “just culture” - <http://patient.sm/role-play->

disclosure

- To access role play materials related to “care for the caregiver” - <http://patient.sm/role-play-care-for-the-caregiver>
- To access role play materials related to “disclosure” - <http://patient.sm/role-play-disclosure>

Resources

I. Videos and patient Stories

A. Survivors

1. Jack Gentry (video)

B. Preventable death: Listed are patient stories in video and written form provided by the PSMF. These provide an opportunity to personalize a patient’s experience and provide a learning opportunity for the student.

1. Grant Visscher (video and written)
2. Pete Conrad (video and written)

C. Provider stories

1. Gwen Cox - nurse who learned from a medication error <https://www.youtube.com/watch?v=2ZVO4qqpiH4>
2. Julia Thao Story (human error/care for the caregiver) <https://www.youtube.com/watch?v=0j-MScJM0So&t=54s>
3. Annie’s Story- Medstar Health. <https://www.youtube.com/watch?v=zeldVu-3DpM>

D. Other relevant videos

1. The “To Err is Human” documentary (accessible via <https://www.toerrishumanfilm.com/>) provides teaching opportunities for the healthcare professional in training. The following clips are relevant to Culture of Safety:
 - a. Lucian Leape M.D. 9:56
 - b. Heather Young 28:40 - 32:50
 - c. Gregg Meyer M.D. 38:00-38:40
 - d. Albert Wu 34:00 - 35:20
 - e. David Mayer M.D. 28:00 - 28:40
 - f. Marianne McGuckin 37:41 - 37:58
 - g. Leah Binder 38:59 - 39:32
 - h. David Nash M. D. MBA 1:03:00 - 1:30:00
 - i. Ashish Jha M.D. 35:25- 36:00, 37:30 - 37:40
 - j. 1979 Hospital Video 8:30 - 9:30
3. AHRQ Video - Care for caregiver following ED misdiagnosis. <https://www.ahrq.gov/professionals/quality-patient-safety/patient-safety-resources/resources/candor/introduction.html>
4. Appropriate Disclosure Video
Appropriate Disclosure to a Patient: Video. Content last reviewed February 2017.
Agency for Healthcare Research and Quality, Rockville, MD. <http://www.ahrq.gov/professionals/quality-patient-safety/patient-safety-resources/resources/candor/>

[videos/appropriate-disclosure.html](#)

5. Inappropriate Disclosure Video
Inappropriate Disclosure to a Patient: Video. Content last reviewed February 2017. Agency for Healthcare Research and Quality, Rockville, MD. <http://www.ahrq.gov/professionals/quality-patient-safety/patient-safety-resources/resources/candor/videos/inappropriate-disclosure.html>
6. Support for the Caregiver (Physician)
Peer Support Interaction - Physician: Video. Content last reviewed February 2017. Agency for Healthcare Research and Quality, Rockville, MD. <http://www.ahrq.gov/professionals/quality-patient-safety/patient-safety-resources/resources/candor/videos/peer-support-physicians.html>
7. Support for the Caregiver (Nurse)
Peer Support Interaction - Nurse: Video. Content last reviewed February 2017. Agency for Healthcare Research and Quality, Rockville, MD. <http://www.ahrq.gov/professionals/quality-patient-safety/patient-safety-resources/resources/candor/videos/peer-support-nurses.html>

II. Clinical Cases

- A. Understanding Patient Safety, 3rd Edition, RWachter and KGupta, Page 282 “An Illustrative Case” (See original publication at Chassin MR, et al. The Wrong Patient. Ann Intern Med 2002;136:826-833)
- B. The Washington Manual of Patient Safety and Quality Improvement, 2016, Clinical Vignette, page 123
- C. The Silence of the Hospital: Lessons on Supporting Patients and Staff After an Adverse Event (the story of Linda Kenney)Case Studies in Patient Safety, JJohnson, HHaskell, PBarach, 2016

III. Local experiences

- A. Lay examples
 1. You leave a message with a front office admin assistant at the elementary school office that you will be picking up your child this Tuesday for an afterschool appointment. On arrival you find that your child was sent home by bus to an empty house.
 2. You are working the Will Call window at the local theater company. Guests arrive to pick up tickets and are upset to find that their chosen seats have been sold and are not available. You recall there was an issue with the computer when they called in the reservation and that you failed to enter the information once the system was back online. Your boss is present. Compare and contrast Boss A’s response (understands culture of safety) to Boss B’s response (does not understand culture of safety)
- B. Clinical examples
 1. An elderly patient picks up their meds at your pharmacy. You needed to substitute the usual furosemide 40 mg with two tabs of furosemide 20 mg daily. This is noted on the label, but the transaction at the desk was handled by a non-clinical staff member. An irate family member calls your pharmacy supervisor to report poor care when the patient develops weight gain and edema after only taking furosemide 20 mg daily over several days. How is this managed in a culture of safety?

2. You are the RN covering for a colleague's lunch time. Your colleague's diabetic patient develops mental status changes. You instruct the aid to check a bedside glucose reading and report back. The result is reported as 90 mg/dl. When you return to the bedside the family says no one has been in and you realize you sent the aid to the wrong patient. How do you attend to the patient now? How do you attend to the family's concerns?

IV. Online resources

- A. CANDOR - Communication and Optimal Resolution (Agency for Healthcare Research and Quality) - a process that healthcare institutions and practitioners can use to respond in a timely, thorough, and just way when unexpected events cause patient harm. This AHRQ toolkit, based on the CANDOR process, is intended to assist hospitals and individuals in implementing communication and optimal resolution of error disclosure <https://www.ahrq.gov/professionals/quality-patient-safety/patient-safety-resources/resources/candor/introduction.html>
 - B. Disclosure Checklist <https://www.ahrq.gov/professionals/quality-patient-safety/patient-safety-resources/resources/candor/module5-checklist.html#.W-nHyDdiXFY.email>
 - C. IHI Open School-PS 104
 - a. Lesson 2: "How Can You Contribute to a Culture of Safety?"
 - D. IHI Open School PS 105
 - a. Lesson 1: "Responding to Adverse Events: A Step by Step Approach"
 - b. Lesson 3: "The Impact of Adverse Events on Caregivers: the Second Victim"
 - E. IHI Open School PS 202
 - a. Lesson 1: "Leading Health Systems Through Adverse Events"
 - b. Lesson 2: "What does a Culture of Safety Look Like"
- F/ Didactic resources**
- F. *The Washington Manual of Patient Safety and Quality Improvement*, 2016, chapter 12 "Culture of Safety", pg 115-136
 - G. *Understanding Patient Safety, 3rd Edition*, RWachter and KGupta, Chapter 15 "Creating a Culture of Safety", pg 281-306

V. Supplemental readings

- A. "Moral Distress in Medical Education and Training", Berger JT. *J Gen Intern Med* 29(2):395-8 DOI: 10.1007/s11606-013-2665-0
- B. "Suffering in Silence: Medical Error and Its Impact on healthcare Providers", Robertson JJ, Long B. *The Journal of Emergency Medicine*, Vol. 54, No. 4, pp. 402-409, 2018. <https://doi.org/10.1016/j.jemermed.2017.12.001>
- C. "The Second Victim: A Review", Coughlan B, et al. *Eur J of OB/G and Repro Bio* 2017;213: 11-16. <http://dx.doi.org/10.1016/j.ejogrb.2017.04.002>

Patient oriented safe care

An aspirational domain

This domain is devoted to patients and families navigating healthcare with attention to

relationship centered communication, engagement as valued team members, and appreciation of “safe care” from the perspective of its recipients.

Subdomain 1: Relationship centered communication; engaging patients and families as team members

Novice - *Describes* the methods of effective communication in engaging patients and families as members of the healthcare team.

Examples of ways competency in this learning objective might be demonstrated:

- Following viewing a PSMF video, learner describes successes and failures of the communication with patient and family that demonstrate their inclusion in the healthcare team.
- Following a shadowing experience in the clinical setting, learner reflects on specifics of communication effective to engage patients and families as part of the healthcare team and notes areas for improvement.
- Following observation of peers in a small group setting practicing clinical communication with a standardized patient, learner notes specific phrasing and nonverbal communication that demonstrate willingness to engage patient in the healthcare team.
- Following a didactic session and reading assignment on patient centered communication, the learner reports back on verbal and nonverbal techniques that welcome patients and families to be part of the healthcare team.
- Following a clinical experience the learner reflects on the effective inclusion of cultural competency in the encounter.

Advanced beginner - *Applies* the methods of effective communication in engaging patients and families as members of the healthcare team.

Examples of ways competency in this learning objective might be demonstrated:

- Following a clinical team interaction while on rounds, learner interviews patient regarding efficacy of team communication to include patient and family in healthcare team and notes opportunities for improvement.
- In a supervised clinical setting, learner applies elements of effective verbal and nonverbal communication to engage patients and families as part of the healthcare team.
- Learner applies verbal and nonverbal communication during participation in role play with interprofessional or peer learners involving clinician, patient, and family member roles.
- Learner practices cultural competency skills and seeks feedback.
- Following a clinical observation, learner reflects on the benefits of clinician communication to engage patient and family as part of the healthcare team.

Competent - *Values* the methods of effective communication in engaging patients and families as members of the healthcare team.

Examples of ways competency in this learning objective might be demonstrated:

- Following a clinical shift, learner reflects on own communication with patients and families and strategizes on steps to improve patient and family engagement as members of the healthcare team.
- Following attendance at case conference involving medical error, learner considers how effective verbal and nonverbal communication to engage patient and family as part of

the healthcare team would have altered outcome.

- Following an encounter with a difficult patient, learner reflects on adequacy of communication and opportunity for patient and family to be included in the healthcare team.
- Following a clinical case management with a clinician mentor, learner gains additional insight into engaging patients and families as members of the healthcare team with verbal and nonverbal communication.
- Reflects on ones own ability to interact in a culturally competent manner.

Proficient - *Models* the methods of effective communication in engaging patients and families as members of the healthcare team.

Examples of ways competency in this learning objective might be demonstrated:

- During clinical team rounds, models both verbal and nonverbal communication to engage patient and family as members of the healthcare team.
- During peer review of cases with suboptimal outcome, proposes communication training for clinical staff to engage patients and families as members of the healthcare team as a process improvement.
- During case management involving interprofessional clinicians, models active communication techniques to include patient and family as members of the healthcare team.
- Models respect and cultural competency for learners and peers.

Expert - *Teaches* the methods of effective communication in engaging patients and families as members of the healthcare team.

Examples of ways competency in this learning objective might be demonstrated:

- During clinical team rounds, gives learners in the moment feedback on communication approach to engage patient and family as part of the healthcare team.
- Facilitates small group sessions for learners practicing role play to apply effective verbal and nonverbal communication that will engage patient and family in the healthcare team.
- Teaches peers and learners at M&M conference the potential benefits of effective communication to engage patient and family as members of the healthcare team.
- Teaches learners struggling to manage difficult patients the benefits of communication to engage patient and family as part of the healthcare team.
- Provides specific feedback for learners and peers to improve cultural competency and benefit patient safety

Subdomain 2: Patient perspective of safe care

Novice - *Identifies* patients' unique backgrounds as they inform individual "safe care" priorities.

Examples of ways competency in this learning objective might be demonstrated:

- Following a reading assignment, learner recognizes impact of patient context on safe care priorities.
- Following review of local health systems patient experience (Press Ganey, etc.) results, learner lists regional patients' priorities for safe care.
- Following shadowing in a clinical setting, learner reports back several patients' top

priorities for safe care.

- Following review of the PA Patient Safety Authority annual report, learner lists patients' priorities for safe care.

Advanced beginner - Investigates patients' unique backgrounds as they inform individual "safe care" priorities.

Examples of ways competency in this learning objective might be demonstrated:

- During a clinical encounter, learner identifies the patient's priority for safe care.
- Following review of a clinical case with a suboptimal outcome, learner discusses in small group potential benefits of understanding the patient's priority for safe care.
- Following a clinical shift of shadowing, learner reflects on variability of patients' priorities for safe care.

Competent - Adapts to patients' unique backgrounds as they inform individual "safe care" priorities.

Examples of ways competency in this learning objective might be demonstrated:

- During clinical encounters, clarifies and incorporates patients' priorities for safe care.
- Following a clinical shift, reflects on success at identifying and respecting patients' priorities for safe care.
- Following a team approach to a complex clinical case, notes a mentor's ability to modify care approach to respect the patient's priority for safe care.

Proficient - Demonstrates interpretation of patients' unique backgrounds as they inform individual "safe care" priorities.

Examples of ways competency in this learning objective might be demonstrated:

- While on team rounds, models identification of each patient's priority for safe care.
- While working on interdisciplinary clinical team, models making of the patient's priority for safe care a team priority as well.
- During peer review of a suboptimal outcome, proposes education for involved clinicians to identify patients' priorities for safe care.

Expert - Explains consideration of patients' unique backgrounds as they inform individual "safe care" priorities.

Examples of ways competency in this learning objective might be demonstrated:

- While on work rounds, teaches team the value of understanding the impact of patient background as it informs patient priorities for safe care.
- Teaches during M&M or peer review meetings the need to identify and incorporate into care plan the patients' priorities for safe care.
- Teaches on interdisciplinary team how the care approach should be modified to meet the priorities of the patient for safe care.

Resources

I. Videos and stories

A. Survivor

1. Alicia Cole (video and written story)

2. Kristen Terlizzi (video and written story)
- B. Preventable death: Listed are patient stories in video and written form provided by the PSMF. These provide an opportunity to personalize a patient's experience and provide a learning opportunity for the student.
 1. Lewis Blackman (video and written story)
 2. Bill Aydt (video and written story)
 3. Jennifer Nibarger (video and written story)

II. Clinical cases

- A. Not Considered a Partner: A Mother's Story of a Tonsillectomy Gone Wrong (the story of Noah Lord) Case Studies in Patient Safety, JJohnson, HHaskell, PBarach, 2016

III. Local experiences

IV. Online resources

- A. 5IHI Open School Patient Safety (PS) 201 "Root Cause and Systems Analysis" <http://www.ihi.org/education/IHIOpenSchool/courses/Pages/default.aspx> Boston, MA: Institute for Healthcare Improvement; 2018; Available on www.IHI.org
- B. WHO Multi-professional Patient Safety Curriculum Guide, "Systems and the Effect of Complexity on Patient Care" http://www.who.int/patientsafety/education/mp_curriculum_tools/en/index3.html
- C. High Reliability in Healthcare: <http://www.jointcommission.org/highreliability.aspx>
- D. Pathways for Patient Safety, Module 3 "Creating Medication Safety" www.hret.org/quality/projects/resources/creating_medication_safety.pdf

V. Didactic resources

VI. Supplemental reading Both suggested supplemental readings may be added

- A. "Patient and Family Engagement: a framework for understanding the elements and developing interventions and policies" Carmen KLetal. *Health Aff*, 2013;32(2):223-31
- B. "Practical Tactics that Improve Both Patient Safety and Patient Perceptions of Care." Gulf Breeze, FL. Studer Group; 2007
- C. "Improving Safety for Hospitalized Patients: much progress but many challenges remain." Kronick R, Arnold S, Brady J. *JAMA Open* 2015;7:2054270415616548.

Conflicts of interest disclosure

The Patient Safety Movement Foundation partners with as many stakeholders as possible to focus on how to address patient safety challenges. The recommendations in the APSS are developed by workgroups that may include patient safety experts, healthcare technology professionals, hospital leaders, patient advocates, and medical technology industry volunteers. Some of the APSSs recommend technologies that are offered by companies involved in the Patient Safety Movement Foundation. The workgroups have concluded, based on available evidence, that these technologies work to address APSS patient safety issues. Workgroup members are required to disclose any potential conflicts of interest.

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