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Special Article

Engaging the Front Line: Tapping into Hospital-Wide Quality and Safety Initiatives

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Healthcare increasingly is moving from volume- to value-based care, with an emphasis on linking a larger percentage of payments to the quality of care provided. There is a renewed interest in designing a focused, strategic approach to quality and safety education and engagement of trainees in hospital-wide quality, safety, and patient experience initiatives.

Hospitals, trainees, and patients benefit as a result of engaging frontline learners in these activities. Hospitals can leverage the intelligence from the front line to contribute to improved hospital safety, increased employee and patient engagement, and better identification of vulnerable areas of safety risks.

Trainees benefit from increased engagement by acquiring fundamentals in quality and safety; are able to satisfy Clinical Learning Environment Review recommendations; have an opportunity to practice a number of skill sets (leadership, communication, collaboration); and complete quality and safety hands-on projects. Patients benefit from a more engaged work force, safer environment for their healthcare, and an improved overall experience.

In this article, the current state of the Johns Hopkins Department of Anesthesiology and Critical Care Medicine's efforts to engage its front line in quality, safety, and patient experience initiatives that are in evolutionary phases of implementation is presented. Evolutionary concepts relate to the Johns Hopkins Health System and the aim of its training program to continuously improve and innovate.

Key Words: graduate medical education; patient safety; quality; patient experience; educational curriculum; experiential learning

THE ADAGE that "all knowledge is local" can be aptly applied to healthcare trainees who, along with nurses, technicians, and advanced practitioners, represent a hospital's front line for quality and patient safety. How can trainees be better prepared to join the next generation of physicians in the work force, one that increasingly is seeing higher percentages of payments linked to the quality of care provided? The recognized importance of expanding resident engagement in quality and safety is reflected in the recent payment structure proposals from the Centers for Medicare and Medicaid Services to link performance-based standards to financial support for graduate medical education (GME).[1–4] Focused, strategic engagement in quality and safety educational programs for trainees with measureable outcomes will be critical to ensure that quality care is provided in hospitals and health systems.[2,5]

Johl and Grigsby recently noted the importance of health system alignment for initiatives and improvement priorities. By applying the information technology industry concept of

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"bidirectional alignment," they described an approach to advance learners within a framework, enabling the front line to partner in advancing health system quality and safety efforts.[6] Bidirectional alignment was defined as "moving or operating in opposing directions or capable of reacting or functioning in opposing directions."[6–8] In the healthcare setting, bidirectional alignment translates into incorporating the voice of frontline learners (ie, trainees' input) into decisions made on the departmental, hospital, and health system levels regarding organizational priorities and initiatives related to healthcare quality and safety. The authors described what many recognize as advantages to trainee engagement—learners have fewer preconceived notions on how things should work, allowing for the introduction of fresh perspectives, and trainees possess a "learning mindset," which contributes to innovative approaches to problem-solving. These bidirectional alignment concepts with frontline learners are believed to be key elements to improve healthcare quality by moving health systems to more proactive systems of care.[6]

Despite competing educational and clinical priorities for trainees, there are numerous reasons from the perspectives of the hospital, trainee, and patients to design and continuously improve upon well-structured programs to support education and engagement in hospital-wide quality and patient safety initiatives. This is particularly true in the cardiovascular and thoracic anesthesia settings, where trainees play a central role in the perioperative care of patients with complex cases and where the importance of a robust frontline culture of quality and safety is magnified. In the authors' experience in the Department of Anesthesiology and Critical Care Medicine at Johns Hopkins, they have recognized the value of increasing trainee involvement in quality and safety initiatives because it improves the safety culture and trainee engagement (Table 1).

Hospital Perspective

From a hospital's perspective, effectively engaging trainees has the potential to contribute to more efficient and safe patient care delivery, improved outcomes, and an enhanced patient experience.[9,10] Education and engagement in quality and safety provide frontline learners with a knowledge base and skill set to execute care paths, assist the hospital in meeting performance metrics, and comply with regulatory protocols. These components are critical as hospitals move from volume- to value-based care. Blanchard et al recently described lessons learned from the Alliance of Independent Academic Medical Centers.[10] This alliance represents medical centers affiliated with US medical schools but that are not part of the medical school governance. The group clearly recognizes the important role of residents in the success of hospital quality of patient care delivery and a need to better integrate quality improvement initiatives with GME.[10] Liao et al provided the following 3 recommendations related to GME reform and the relationship between medical institutions, quality improvement education, and learning environments: creating common institutional quality curricula, engaging trainees in institutional quality improvement initiatives via project work, and holding focus groups with institutional leadership and integrating residents into institutional decision-making with membership on the institution's quality improvement committees.[2]

Hospital engagement with trainees empowers the front line to recognize and report safety risks and near misses, ideally before they become sentinel events. The notion of the "pyramid of errors" conceptually illustrates the more common occurrence of near misses versus severe injuries. This original concept regarding foundations of a major injury was developed from the industrial accident prevention literature that described a hierarchical relationship in which the base of the pyramid represents unsafe practices or conditions, followed by a fewer number of noninjury accidents, followed by fewer occurrences of minor injuries, and lastly the occurrence of major injuries (Fig 1). More than 50 years ago, these authors emphasized the more frequent occurrences of similar accidents, with no injuries for every mishap resulting in injury.[11] In the healthcare setting, a hospital's ability to create a culture in which the frontline learner is engaged in prioritization of quality initiatives and identification of near-miss events (no-injury events) has the potential to contribute to improved hospital safety and better patient outcomes.

Cardiovascular and thoracic fellows and residents play a crucial role in these efforts because they represent the front line. Complex perioperative settings with multidisciplinary care teams routinely involve a number of care transitions and multiple

Table 1
Top 10 Reasons for Trainee Engagement in Quality and Safety Initiatives From the Stakeholder Perspective

Hospital	Resident
Residents represent the hospital's front line in patient care delivery; their engagement contributes to "bidirectional alignment"	Trainees can learn fundamentals of quality and patient safety
A bottom-up (trainee engagement) versus a top-down approach is an effective approach for successful improvement efforts	Trainees can meet ACGME Clinical Learning Environment Review recommendations
Leveraging intelligence from the front line can assist with aligning hospital improvement priorities	Residents can learn and practice collaboration, leadership, and communication skills sets; skill acquisition
Frontline engagement can lead to improved employee and patient engagement	Initiatives often are "doable" (ie, able to be completed within timeline of the training program)
Frontline learner engagement contributes to hospital safety (ie, risk reduction via identification of near misses/potential avoidance of sentinel events)	Frontline learners can benefit from "seeing through the eyes of the patient" (ie, increased patient and family engagement)

Abbreviation: ACGME, Accreditation Council for Graduate Medical Education.

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Fig 1. Foundations of a major injury. Unsafe conditions and practices are more common than are major injuries that result in severe harm. Ideal interventions address the level of unsafe conditions and practices, rather than the point of major injury. Frontline learners are ideally suited to partner with the hospital to identify near-miss events or unsafe practices, before they result in patient injury. Reproduced with permission.[11]

patient care handoffs; thus, trainees who are engaged and settings in which the culture embraces quality and patient safety best equip the trainee to identify and report near-miss events.

Trainee Perspective

From the trainee perspective, active engagement in quality and safety initiatives is part of the Accreditation Council for Graduate Medical Education (ACGME) Clinical Learning Environment Review program requirements for GME. Documentation requirements in systems-based practice competency training emphasize trainee engagement and recognition of the larger context of the healthcare system. Furthermore, recommendations emphasize trainee participation in multidisciplinary teams to improve quality of care and patient safety, identify system errors, and problem solve for system solutions. Hospital and GME leadership support for quality and safety trainee engagement is crucial to successful engagement.[9,12–15] These recommendations support departmental- and hospital-wide initiatives to more actively engage trainees in meaningful quality and safety work and are aligned with the concept of bidirectional learning.

Beyond fulfilling requirements, trainees benefit by working closely with skilled multidisciplinary healthcare teams to learn and practice team-based communication skills, leadership competencies, and operational efficiencies in a real-world setting. This enhances knowledge of their current and future role in health systems and allows them to recognize their important contribution to patients' healthcare experience.[16–19] The opportunity to engage in interdisciplinary quality improvement work also meets the ACGME goal of interdisciplinary educational experiences. Cardiac anesthesia fellows and residents can work on team skills with perfusionists, operating room nurses, physician assistants, and surgeons. Furthermore, depending on the depth and quality of the improvement work, there is potential to meet resident scholarly activity requirements. An added benefit was described by Simasek et al who reported that their longitudinal outpatient practice improvement rotation curriculum meets the scholarly activity and quality improvement requirements. Their trainee engagement resulted in local, state, regional, and national presentations and awards and grant funding.[20]

Getting Started: A Framework for Meaningful Engagement

Residents and fellows begin their training with variable competencies in quality, safety, and patient-centered care. Although components of medical school curriculum expose students to these concepts, a foundation in quality and patient safety and experiential learning opportunities before residency training is uncommon.

Tess et al recently described 6 essential components of a detailed framework to integrate residents in academic teaching hospitals' quality and safety initiatives. Core tenets of their recommendations included providing experiential learning opportunities, with actual patient safety-related cases, data, and a core curriculum consistent with their quality and safety opportunities in the clinical learning environment.[21] The framework's 6 key elements are organizational culture, teaching hospital–GME alignment, infrastructure, curricular resources, faculty development, and interprofessional collaboration (Fig 2).

There are several other reported experiential and team-based approaches to framing educational opportunities for trainees in quality improvement within specific training programs. Hall Barber et al described a 3-stage first-year family practice residency curriculum partitioned as (1) engaging: the trainee chooses a project, engages stakeholders, and collects data on the current state; (2) understanding: clear delineation of the problem, understanding the results, and application of quality

Fig 2. An overview of a framework for integrating the quality and safety mission of a teaching hospital and GME. Reproduced with permission.[21]

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improvement tool sets; and (3) improving and translating the new-found knowledge. Their longitudinal curriculum program has features of successful engagement (ie, they engaged trainees in real-world quality initiatives rather than simply learning the theory of quality improvement).[22] Johnson Faherty et al described the following 3 models for engaging trainees in quality and safety initiatives: one for short-term engagement at the team level, the second for mid-duration at the unit level, and a third for long-term engagement at the health system–wide level. They proposed that by working concepts of quality and safety into routine clinical practice, a number of barriers associated with trainee engagement can be overcome.[23]

In response to a survey that identified practice-based learning gaps, Kelz et al reported on a potential solution to assist surgical residency training program directors with quality training initiatives. Their quality training initiatives involved a data-centered approach that combined quality education embedded throughout the clinical and educational continuum, along with a collection of surgical clinical outcomes data.[3] Another approach involved a quality and safety educational module tool that was developed by Gupta et al for their neonatology fellowship training program. Features of their longitudinal program included didactic and experiential quality and safety modules, workshops, quality and safety project work, and trainee feedback via survey instruments.[24]

Lastly, Philibert et al described key features of their pediatric training program's quality and patient safety education, which focuses on lectures, implementation, and sustainability. They described the following 5 "take aways" that can be broadly applied to any specialty training program: (1) enhance quality improvement education modules to ensure baseline knowledge, (2) develop opportunities for faculty to enable them to teach and apply quality improvement in the clinical practice setting, (3) ensure that education in quality improvement occurs for all residents, (4) recognize and overcome time constraints in residents' schedules to allow for application of newly developed quality improvement skill sets, and (5) perform an outcomes assessment of the residents' quality improvement exposure.[25]

The following barriers to successfully implementing a quality and safety curriculum and frontline learner engagement should be recognized: resident and faculty time constraints, a need for an adequate number of quality improvement facilitators, resident and faculty scheduling needs, infrastructure support for longitudinal versus episodic integration into training programs,[22] training programs with different needs (proceduralists versus nonproceduralists), and an overprescribed GME curriculum.[2] Institutional leadership that supports a culture that values quality, safety, and reliability is key to managing barriers and program success.[22]

The authors of this review now describe design features of their training program and elements that are in evolutionary phases of trainee engagement in departmental- and hospital-wide quality, safety, and patient-centered care initiatives. Evolutionary concepts relate to the aims of their health system and training program to continuously improve and innovate.

Operationalizing Education

Education in Quality and Safety

An ability to become engaged in meaningful departmental- and hospital-wide quality and safety initiatives requires foundation knowledge of quality and patient safety. Curriculum centered on baseline essential knowledge ideally is covered in the first clinical anesthesia (CA) year and supplemented with more advanced concepts, learning opportunities, and engagement initiatives in the CA-2 and CA-3 years. In addition to curriculum and simulation laboratory exposure, the Department of Anesthesiology and Critical Care Medicine (ACCM) at Johns Hopkins is leveraging learning modules from the Institute for Healthcare Improvement's (IHI) Open School for baseline learning in quality, safety, and patient-centered care.[26] The IHI Open School allows for data tracking on the individual resident's progression with module completion. Completion of a specific series of Open School course modules in the categories of improvement capability, patient safety, triple aim for populations, person- and family-centered care, and leadership allows the trainee to earn a basic certificate in quality and safety from the IHI Open School (Table 2 and Fig 3).[26]

College Days Curriculum: Quality, Safety, and Patient Experience

In 2009, the ACCM initiated a comprehensive resident education program called College Days. Two protected education days per month were secured during which time residents had no clinical responsibilities. The design of College Days was specifically interactive and more learner-centered than large classroom designs. This approach sought to build a community of learning and engagement for the students in an interactive, reflective, and social milieu. The protected time allowed program leaders to set an expectation for learner preparation and to create a multifaceted and multidisciplinary education program using teaching strategies other than lecture-style didactics. The program teaches to the 6 ACGME core competencies; American Board of Anesthesiology content outline; all components of the American Board of Anesthesiology staged examination process; and topics such as business aspects of healthcare, ethics, leadership development, and quality and safety education.

The original College Days curriculum in quality and safety was described in 2011.[27] The design provided 1-to-2 hours per month of classroom time devoted to developing an understanding of the fundamentals of safety and quality and how to critically evaluate the literature and investigate defects. Sessions included interactive exercises starting with a discussion of healthcare delivery, use of the scientific method to evaluate the effectiveness of quality and safety projects, understanding system interactions, and how to develop safer systems (Table 3).[27] In the original design of this program, residents would participate in classwork for CA-1 year and projects during CA-2 and CA-3 years. Currently, residents are engaged

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Table 2
IHI Open School Online Courses

Improvement Capability	Safety	Leadership and Patient- and Family-Centered Care	Triple Aim for Populations
Introduction to Healthcare Improvement (CA-1)	Introduction to Patient Safety (CA-1)	Introduction to Healthcare Leadership (CA-1, CA-2)	Introduction to the Triple Aim for Populations (CA-3)
How to Improve with the Model for Improvement (CA-1)	From Error to Harm (CA-1)	Introduction to Person-and Family-Centered Care (CA-1, CA-2)	Improving Health Equity (CA-3)
Testing and Measuring Changes with the PDSA Cycles (CA-1)	Human Factors and Safety (CA-1)	Dignity and Respect (CA-1, CA-2)	Quality, Cost, and Value in Healthcare (CA-3)
Interpreting Data: Run Charts, Control Charts and other Measurement Tools (CA-1)	Teamwork and Communication in a Culture of Safety (CA-1)		
Leading Quality Improvement (CA-2)	Responding to Adverse Events (CA-1)		
Planning for Spread: From Local Improvements to System-wide Change (CA-2)	Root Cause and Systems Analysis (CA-1)		
Achieving Breakthrough Quality, Access and Affordability (CA-3)	Building a Culture of Safety (CA-1)		
Guide to the IHI Open School Quality Improvement Practicum (CA-1, CA-2)			

NOTE. Departmental Clinical Anesthesia (CA) with year denotes the Department of Anesthesiology and Critical Care Medicine's recommendation for staged use of selected modules within its residency curriculum in quality and patient safety with the Open School curriculum.[1]
Abbreviation: PDSA, Plan, Do, Study, Act

in projects during their CA-1 year, and the program is in the process of incorporating additional training using the IHI Open School modules as previously described (see Table 2). For example, after completing the basic modules, a resident interested in cardiac anesthesia might join a project focused on turnover time in cardiac operating rooms or design a project to encourage the use of epoprostenol over inhaled nitric oxide.

Education in Leadership Competencies

Custom education in leadership training and core leadership competencies are important to the development of a quality and safety leader. The ACCM leadership model is that of serving leadership. Serving leadership is the belief that a leader must first be a servant, pursuing not his or her own success but rather empowering employees to find success themselves. A serving leader inverts the traditional pyramid that places a single executive at the top of the organizational structure, putting himself or herself at the bottom of an inverted pyramid, helping others to rise to meet their goals and thereby promoting the overall success of the organization. A serving leader is more a coach than a commander, spends equal time on relationships and results, and constantly seeks to remove obstacles from his or her employees so that they can achieve ever greater success (Fig 4).

Nearly 60 ACCM members have completed a 6-month training program in serving leadership. Theory and learnings from the 6-month serving leadership training course are being incorporated into the ACCM's training program, formal residency curriculum, grand rounds, and departmental meetings. For example, a serving leader seeks to make all members of his or her team feel valued as individuals and appreciated as contributors to the success of the team. Residents engage in role-playing exercises whereby they act out situations in which conflict arises in the operating room, the intensive care unit (ICU), or the labor and delivery floor. They practice taking a

Fig 3. A screen shot of the ACCM IHI online data tracking for Open School module completion.[35]

Table 3
ACCM College Days Curriculum in Quality and Patient Safety

Classroom Component	Project Component
• Science of safety	• First year of program
• Learning from defects	• Re-dosing antibiotics
• Evidence-based medicine principles: therapy article	• Beta-blockade
• Evidence-based medicine principles: diagnostic article	• Epidural use in the ICU
• Evidence-based medicine principles: systematic review	• High-cost medicines/supplies
• Translating knowledge into practice	• Recycling
• System barriers	• Blood wastage
• Walking the process	• Johns Hopkins practices and compendium
• Navigating the Institutional Review Board	• IV infiltration
• Error reporting systems	• Perioperative communication
• Statistics I	• Good catch
• Statistics II	• DART team
• Library resources overview	• Medication reconciliation and labeling
• Explicit evidence: developing search strategies	
• Project management	

Abbreviations: ACCM, Department of Anesthesiology and Critical Care Medicine; DART, Difficult Airway Response Team; IV, intravenous.

step back rather than reacting immediately. They seek to understand the underlying reasons for the conflict and to bring out the voices of others who may not feel heard. To the team member who is angry, they ask, "What would this look like if it were working for you?" A cardiac anesthesia fellow trained in this method of leadership might note, for example, that the perfusionist did not feel that he or she was being invited to participate in case planning and prioritization and then would help the perfusionists feel empowered to take a larger role, identifying barriers to him or her doing so and then helping to remove those barriers.

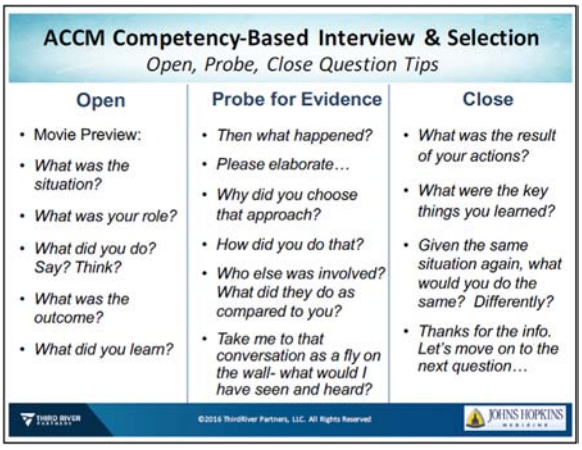

Fig 5. Competency-based interview guide for prospective members of ACCM. Reproduced with permission from Third River Partners.

To identify candidates for ACCM's residency program who are likely to thrive in the culture of serving leadership, the department recently incorporated competency-based interviewing into the resident interview process. This technique seeks to replace traditional questions such as, "Why did you choose anesthesiology?" with questions about how candidates have acted in specific situations and leadership roles. The idea is that past experience and behavior are excellent predictors of future performance. After candidates are asked to tell about how they decided whom to include on their team when they were in a leadership role, how they handled conflict among team members, and how they helped their team members achieve success, this information is used to determine whether the candidate would add to the cohesiveness of the department's residency program and be a good fit in its culture of serving leadership (Fig 5).

Education in Patient- and Family-Centered Care

Patient- and family-centered care are as important in the perioperative environment as they are in primary care medicine.

Fig 4. Illustration of serving leadership, the leadership model for the ACCM. Reproduced with permission from Third River Partners.

Table 4
Departmental College Day Curriculum for Patient- and Family-Centered Care

Patient-and Family-Centered Care Learning Opportunities Formal Educational Sessions on 1 College Day	
Sessions and Learning Goals	**Content**
Chief patient experience officer presentation: • Define rating and pay for performance systems • Why communication matters • How to communicate effectively with patients • Usable strategies for improving the patient experience	Assessment and scoring • Hospital Consumer Assessment of Healthcare Providers and Systems Pay for Performance • Reputation: Star Ratings Improvement of the patient experience • Patient/family high expectations of what is about to happen and the cumulative evaluation of their journey through the system • Respect for patients' values, preferences, and expressed needs • Coordination and integration of care • Information, communication, and education • Physical comfort • Emotional support • Involvement of family and friends Why communication matters • Negative patient experiences are harms just as iatrogenic infections are • Patients care about how their doctors make them feel and about how they care • Effective communication supports safe, high-quality, team-based patient care • Caring is integral to curing Communication checklist
An actual patient experience Facilitated discussion with 1 patient who did not have a positive experience • Learn patient's perception of what was said and what was done • Opportunity to improve	Facilitated interview • A patient describes his or her experience and feelings • Residents inquiry on how to improve their communication skills
Simulations in patient experience • Role plays in teams of 3 • In each scene there is a patient, a family member, and an anesthesiologist • Each team completes 3 scenarios, and for each case, the residents play a different roll; upon completion of the role plays, there is a facilitated debriefing with a faculty member who has observed the role plays	Case 1 An 18-year-old female Gravida 1 (G1), Para 0 (P0) at 38 weeks gestation is admitted to the labor and delivery suite in labor. Her medical history is significant for preeclampsia, and the toxicology screen is positive for recent marijuana use. She is accompanied by her mother and the father of her baby. The patient currently is 5-cm dilated and has been requesting an epidural for the last hour for what she reports is 10/10 pain. The anesthesiologist was delayed in seeing the patient because she or he was working on a patient undergoing a C-section in the operating room. Case 2 The patient is a 2-year-old who was born at 32 week's gestation and spent months in the neonatal ICU with problems related to a tracheoesophageal fistula that was repaired when he was 2 days old. He also has an imperforate anus and a single kidney. There is no congenital heart abnormality. The child has had numerous problems with reflux and esophageal stricture, has renal tubular acidosis, and is scheduled to undergo anal reconstruction and rectal pull through. The child has had numerous postoperative admissions to the pediatric ICU for respiratory problems. The patient is accompanied by his parents. The patient's mother called the pediatric anesthesia office to try to speak with the anesthesiologist who would care for her child. Over the last few days, she left several messages and spoke once with the secretary who said the anesthesiologist would call the family. The family never received a phone call. Case 3 The patient is a 62-year-old scheduled for ambulatory surgery to undergo a wide excision of a melanoma on the chest and sentinel lymph node biopsy. She has a history of hypertension, stable coronary artery disease (CAD), obesity, asthma, anxiety, and depression. The patient was not evaluated in the preoperative evaluation center, and there is a history and physical examination on the chart that were performed by her primary care provider. The primary care provider mentioned in his note that general anesthesia should not be performed because of the patient's asthma and CAD. There is supporting documentation of stable CAD with no change over the past 5 years. She has normal Left Ventricular Function (LVF). Her body mass index is 30 kg/m^2. An electrocadiogram shows Left Ventricular Hypertrophy (LVH) but otherwise is normal. Today she is normotensive and compliant with medications (Hydrochlorothiazide (HCTZ) and lisinopril, which she did not take today). Her lungs are clear. She is very anxious. The surgeon informs you that a deep and wide excision will be needed.
Presentation on cultural competency • To raise awareness of differences	• Diversity • Cultural sensitivity

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Table 4 (*continued*)

Patient-and Family-Centered Care Learning Opportunities Formal Educational Sessions on 1 College Day	
Sessions and Learning Goals	Content
• To raise awareness of our feelings Reading materials	• Self-awareness 1. Cousin G, Schmid Mast M, Roter DL, et al. Concordance between physician communication style and patient attitudes predicts patient satisfaction. Patient Ed Couns 2013;87:193–7. 2. Wynia M, Papadakis ML, Sullivan WM, et al. More than a list of values and desired behaviors: A foundational understanding of medical professionalism. Acad Med 2014;89:712–5. 3. Kumagai AK, Lypson ML. Beyond cultural competence: Critical consciousness, social justice and multicultural education. Acad Med 2009;84:782–7. 4. Cloud H. Character, integrity and reality. In: Cloud H (ed). Integrity: The courage to meet the demands of reality. New York, NY, Harper Collins, pp 13-21.

Abbreviations: ACCM, Department of Anesthesiology and Critical Care Medicine; HCT, LVF, LVH.

To help residents learn these principles, the authors created a College Day centered on the following aspects of the patient experience: measurement tools, experiential learning, Johns Hopkins Hospital metrics, cultural sensitivity training, and more. In addition, the Johns Hopkins chief patient experience officer interfaces with the department's residents to provide focused sessions on Hospital Consumer Assessment of Healthcare Providers and Systems, measures of pay-for-performance, reputation, and components of the patient experience metrics (Table 4).

The patient experience curriculum involves interactive discussions with residents on how to meet a patient's expectation during the patient's journey through the health system and how encounters may influence patients' experiences within the system. In addition, residents interface with a patient who describes to them a disappointing experience with the healthcare system. Residents have found this first-hand patient experience to be valuable because they were able to study the steps along this patient's healthcare continuum and determine specific events that could have been avoided. Finally, to continue this learning, residents are divided into small groups to engage in role plays and debrief on case situations. Each resident takes a turn playing the role of the patient, the family member, and the medical provider. All interactions are viewed by a faculty facilitator who then debriefs the group using a specific set of questions. Table 5.

Focus on Customer Service/Patient Experience

A great deal of what patients and families remember and value in their interactions with healthcare environments and providers is related to customer service—how they were greeted, treated, and supported during their care. The ACCM dedicated a faculty retreat to a workshop on customer service by partnering with ZingTrain (Ann Arbor, MI) for Zingerman's training.

Zingerman's Community of Businesses is a gourmet food business group known for its incredible customer service delivery. Founders Ari Weinzweig and Katie Frank from the ZingTrain team joined the department's faculty for an interactive day of teaching called "the art of giving great service." The workshop challenged faculty to first introspect and understand how their energy on any given day can affect interactions with customers—both patients and colleagues. The workshop also focused on building a common understanding of patient and family service "wants" and how

Table 5
Inventory of Opportunities: Departmental, Hospital, and Health System

Departmental	Hospital and Health System
HERO event reporting	HERO event reporting
Monthly problem-based learning discussions	Clinical communities
Serving leadership competencies (Third River Partners, Pittsburgh, PA)	CUSP teams
Patient experience education (Zingerman's Customer Service Training)	Patient experience education (chief experience officer), hospital-wide lecture series (Armstrong Institute)
ACCM dashboard of department quality and safety initiatives	ACCM dashboard of departmental and hospital level quality and safety initiatives
Simulation menu of activities on safety, quality, and patient experience	Simulation on end-of-life, organ donation and patient experience
Behavioral-based competency interviewing	TEAM Steps (registered trademark)/Lean
Weekly perioperative and hospital safety rounds	Weekly hospital safety rounds
Wellness Committee	Patient and family council
Listening and communication training	Health system supply chain

Abbreviations: ACCM, Department of Anesthesiology and Critical Care Medicine; CUSP, Comprehensive Unit-Based Safety Program; HERO, Hopkins Event Reporting.

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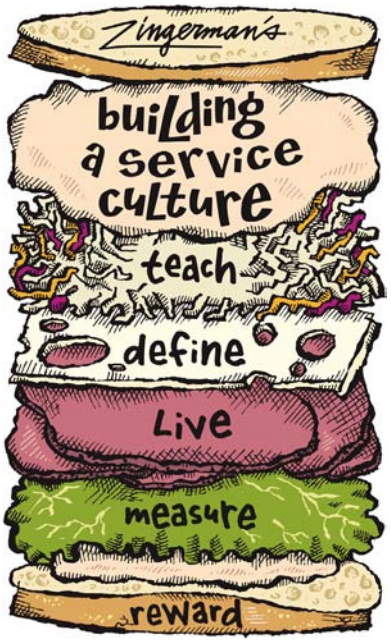

Fig 6. The patient experience via education in business customer service models. The Zingerman's method of creating a culture of service involves teaching all employees service standards while committing to those same principles in the way employees and colleagues are treated. Reproduced with permission from Zingerman's.

providers can and should go beyond that to deliver great service. The ZingTrain team provided insight into measuring and ingraining service into the organizational culture (Fig 6).

Even though the retreat was geared toward departmental faculty, lessons learned were translated to trainees through role modeling in real time. When faculty members model great customer service/patient experience, trainees understand it as an expectation in delivering patient- and family-centered care. In addition, these concepts continue to be reinforced in patient experience sessions involving both simulations and real patients as previously described. This is especially applicable in cardiac surgery in which patients almost always interact extensively with ACCM trainees for extended periods, first in the preoperative assessment clinic, then in the preoperative area, operating room, ICU, and finally the floor. Families and patients in the cardiac ICU often have many questions and concerns, and this opportunity is ripe to demonstrate excellent customer service and make their experience a positive one.

Engagement Opportunities in Departmental- and Hospital-Wide Quality and Safety

Restructure of the Monthly Problem-Based Learning Discussion

Through the serving leader framework, the ACCM's monthly problem-based learning discussion (PBLD), formerly known as the departmental morbidity and mortality conference, was restructured. Faculty identified the following greater goals for improving patient care: (1) recognizing systems and processes that need improvement; (2) educating professionals about best-evidence practice guidelines; (3) promoting teamwork and fostering professionalism and resilience among residents, nurse anesthetists, and faculty; and (4) promoting a just culture. A just culture, as opposed to a blame culture, promotes speaking up when individual or systems failures occur because it is widely recognized that the individual will not be punished. Humans will eventually err, but there should be balanced accountability between individuals and systems to prevent human error as much as possible.[28]

The current reality of PBLD was examined closely, focusing on department strengths and barriers. The 3 recognized barriers were (1) fear of admitting mistakes and being judged by colleagues, (2) PowerPoint presentation development and fear of public speaking, and (3) inconsistency in team involvement. In focusing on the most consistent barrier of the fear of being judged by one's colleagues, the department received education on a just culture and how frequently there are systems that need improvement, as opposed to attributing blame to ineptness of an individual. Educators in the department were engaged to become the experts and present along with the anesthesia team. The moderator has begun providing updates regarding solutions that are suggested during the PBLD discussion to improve system failures. By building on strengths and breaking through barriers using the serving leadership framework, departmental discussion has been restructured and can be highly useful to educate physician trainees, nurse anesthetists, and faculty on quality and safety.

Resident Well-being and Patient Quality and Safety

Wellness is a concept that has only recently become a focus in the field of medicine; it is becoming widely recognized that wellness is extremely important for physicians in all stages of training and post-training to deliver high-quality and safe patient care. A link between resident physician burnout and medical errors has been reported by a number of authors, suggesting that resident burnout has direct effects on patient safety.[29]

The ACCM has been investing in physician wellness at all levels. The department recently finished a pilot program called the Point Bank on the Job (PB&J) rewards program for pediatric anesthesia faculty members in which faculty members earned points for participating in activities related to the strategic mission of the department. These points could be used toward rewards such as meal delivery, house cleaning services, groceries, and gym membership. Currently, many of the concepts associated with the PB&J pilot program are being transitioned to a department-wide initiative to expand wellness to all anesthesia providers, especially the anesthesia residents.

The ACCM Wellness Committee includes residency program leadership members who are engaged in measuring constructs associated with resident wellness; the committee plans to deploy interventions based on those findings. The committee is exploring avenues to facilitate wellness-related resource deployment, opportunities for physician colleagues to express gratitude to one another, and rewards opportunities

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that mimic those of the PB&J pilot program for all physicians within ACCM.

ACCM also sponsors the residency program to hold an annual departmental resident retreat. Residents self-divide into 4 groups based on interest. One of these groups focuses on well-being. This resident well-being committee works with residency leadership to plan events to promote resident well-being, such as monthly end-of-block parties.

The department has in place a robust system of checking on resident well-being and supporting residents facing challenges. Residents are divided into 4 colleges, each with a college leader who also serves as an advisor to the residents in his or her college. These college leaders meet individually with residents at least twice a year and more frequently for residents who need more support. When a resident deals with a traumatic experience at work such as the death of a patient, the resident is relieved from duty and is provided with support to talk through the event. Furthermore, the hospital has instituted a team of individuals who are on call 24 hours a day to respond to any provider who has experienced a traumatic event and wants a chance to debrief confidentially. Finally, the department works with its faculty and senior residents to encourage them to recognize signs of fatigue in junior residents and to provide rests whenever possible to alleviate their fatigue. When needed, a comprehensive jeopardy system is in place that can be activated to relieve a resident from a call if he or she is too fatigued, or not mentally ready, to work the shift. Department leaders firmly believe that focusing on wellness departmentally will enhance resident morale and engagement, which may, in turn, benefit the quality of care provided and patient experience and safety.

Hospital-wide and Health System–wide Engagement Opportunities

Broad participation of trainees in the institutional and health system structure of quality improvement is important to successful quality and patient safety initiatives. Department trainees are, or are becoming, engaged in the (Table 5) following two hospital-wide systems: Hopkins Event Reporting Online (HERO) and Comprehensive Unit-Based Safety Program (CUSP).[30,31]

Hospital-wide: Hospital Event Reporting Online

Creating a culture of safety within a healthcare organization is vital to understanding potential sources for patient harm. The Johns Hopkins Health System partners with frontline clinicians, patient safety officers, quality improvement staff, patients, and families to identify near miss and adverse events, unsafe conditions, and practice concerns that have or could lead to patient harm. The HERO system, a voluntary incident reporting system, was implemented in January 2015. HERO uses a harm score system—A through F—to identify the severity of an event. This harm scoring system allows the clinician placing the HERO to signify whether the event reached a patient and to signify whether the event led to increased morbidity or a patient fatality. Hospital leadership is notified of events with harm scores that signify severe harm or death within hours of the event taking place. Harm scores signifying less severe events are reported to leadership and safety officers in a daily report. The Department of Health and Human Services has reported that voluntary event reporting systems only capture a small fraction of patient events[32]; however, the authors believe these events can provide signals that guide efforts to improve patient safety. Identifying event trends over time also can focus improvement efforts to achieve maximal impact on patient safety.

The ACCM has identified a triage system for responding to HERO reports that allows for a comprehensive system view of events across the Johns Hopkins Health System and brings accountability for responding to events to the departmental level. Each of ACCM's divisions has an identified quality and safety director who is responsible for investigating events, performing peer review, identifying and presenting events for discussion at a divisional quality meeting, and responding to events in the HERO system. The ACCM Quality, Safety, and Service (ACCM QSS) team includes a vice-chair, director, assistant director physician leader, a member of the administrative team, a patient safety officer, and a quality improvement team leader. The patient safety officer reads each HERO event daily and triages events to the physician advisor, the assistant administrator for operations, or to the divisional QSS director. The quality improvement team leader acts as a mentor for the safety officer to identify trends and areas that could indicate a need for a departmental response and brings these trends to a monthly QSS meeting for interdisciplinary discussion. This robust system allows for investigation and analysis of both trends and individual signals that could signify opportunities for improvement and leads to a continuous review of the health system that is informed by frontline clinicians and staff.

Comprehensive Unit–based Safety Program

Developing a culture of safety throughout an organization is the foundation for eliminating preventable harm. The Johns Hopkins Health System supports the science of patient safety and strives toward creating a culture of safety in every department throughout its health system. Johns Hopkins patient safety researchers developed CUSP, which empowers frontline caregivers to identify patient safety concerns, brainstorm solutions, and implement changes at a unit level to make the hospital system safer for patient care.[30,31,33] The Armstrong Institute of Johns Hopkins Medicine provides safety, team, quality, and CUSP training to employees and students to support these unit-based teams. These efforts support staff in identifying system barriers to patient safety and implementing change that shifts the focus of improvement efforts from individual error to system failures. This philosophy provides a framework for team members to discuss patient safety in a nonthreatening environment and promotes creativity and problem-solving at the unit and hospital levels.

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At Johns Hopkins Hospital, ACCM supports CUSP teams and the culture of safety by participating in CUSP activities such as safety rounding in operating rooms, postanesthesia care units, and ICUs. The department also participates in CUSP team meetings and brings safety issues to these forums for interdisciplinary discussion and problem-solving.

Despite the international success of the CUSP approach to quality improvement, residents have not taken part in these teams consistently. In the coming months, ACCM will pilot a program in which department trainees will receive an introductory session on CUSP and will supplement this with the IHI modules previously described that will provide them with the background vocabulary to understand the work of the teams. They will then join 1 of several perioperative CUSP teams (preoperative area, postanesthesia care units, operating rooms, ICUs, labor and delivery) and will meet with the team regularly to learn the process first hand and to contribute their valuable frontline perspective. Residents interested in cardiac anesthesia, for example, could join the cardiac anesthesia operating room or cardiac surgical ICU CUSP team made up of nurses, perfusionists, surgeons, anesthesiologists, and technicians partnered with a senior executive and explore quality improvement initiatives alongside this interdisciplinary team of frontline providers.

Residents on CUSP teams will meet quarterly with an experienced CUSP coach—a faculty member who has had years of experience with the CUSP process—to discuss what they have learned during their time with the CUSP team and to discuss the resident's contribution to the team.

Residents who wish to pursue the model further have several opportunities, including an online patient quality, safety, and outcomes certificate through the Bloomberg School of Public Health; a patient safety and quality practicum; additional training through the Armstrong Institute for Quality and Safety; and the opportunity to join faculty on international trips to teach the CUSP process to quality leaders at hospitals abroad.

Clinical Communities

Gould et al described the development of clinical communities at the Johns Hopkins School of Medicine.[34] Clinical communities represent groups of frontline providers within the Johns Hopkins Health System who come together to focus on improving quality, safety, efficiencies, and more. These groups are led by a quality improvement expert, in this case from the Johns Hopkins Armstrong Institute for Patient Safety and Quality. Opportunities identified by these communities are addressed in a collaborative manner benefiting all involved. For example, a clinical community was formed among all providers involved in congestive heart failure care. They identified that patients at each institution were confused by the patient education materials. A group of nurse educators from each hospital worked together to create a new 1-page pamphlet that is now given to all heart failure patients at all hospitals in the clinical community.[34] An ACCM clinical community exists within the 5 Johns Hopkins hospitals and is centered on the anesthesia supply chain, with efforts to reduce product variability (ie, standardize anesthesia-related supplies across the Johns Hopkins Health System). Even though trainees currently are not engaged in this clinical community, there may be an opportunity to engage them in the near future.

Conclusion

This approach to education and engagement features key concepts leading to innovation in education; experiential learning; inclusion of contemporary learning theories; and a desire to continuously improve approaches to quality, safety, and patient experience for trainees. The authors echo Johl and Grigsby's belief that "staying ahead of the curve" will require healthcare organizations to develop strategies to programmatically include frontline learners in bidirectional alignment with healthcare systems priorities. The authors of this article agree with their perspective that frontline trainees represent an "untapped source of innovation."[6] As healthcare is evolving, so, too, is the strategic approach to trainee engagement in departmental, hospital, and health system efforts to ensure that care environments are safer, the quality of care delivered is excellent, and trainees are better equipped to successfully enter a dynamically changing healthcare environment.

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