



UNMET NEEDS

Teaching Physicians to Provide Safe Patient Care

Report of the
Lucian Leape Institute Roundtable
On Reforming Medical Education



**LUCIAN
LEAPE
INSTITUTE**
— AT THE —
NATIONAL PATIENT
SAFETY FOUNDATION

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**Providing a strategic vision
for improving patient safety**



Lucian Leape Institute at the National Patient Safety Foundation

The Lucian Leape Institute was formed in 2007 to provide thought leadership and a strategic vision for improving patient safety. Composed of thought leaders in patient safety, the Institute functions as a think tank to identify new approaches to improving patient safety and to encourage key stakeholders to assume significant roles in advancing patient safety.

The initial work of the Institute has focused on identifying and framing vital transforming concepts that require system-level attention and action. The five concepts identified to date include medical education reform; active consumer engagement in all aspects of health care; transparency as a practiced value in everything we do; integration of care within and across health care delivery systems; and restoration of joy and meaning in work. These concepts are described in the Institute's first work product, "Transforming healthcare: a safety imperative," recently published in *Quality and Safety in Health Care*.^{*} Fulfilling the objectives embodied in these five concepts is critical to moving the national patient safety agenda forward; it is clear that this will require profound changes in the culture and structure of our health care system. Expert Roundtables will be convened to address each of these transforming concepts.

This white paper addresses the first major concept—medical education reform. The problem analysis and recommendations set forth herein are the result of in-depth deliberations by an Expert Roundtable on Reforming Medical Education that included a broad array of medical education leaders, students, patients, representatives from key organizations, experts from related fields, and members of the Institute. The Roundtable met in extended sessions in Boston in October 2008 and June 2009. This report describes the consensus achieved regarding the current state of medical education, what medical education should ideally become, and what strategies should be used to leverage desired changes in medical education.

National Patient Safety Foundation

The National Patient Safety Foundation has been diligently pursuing one mission since its founding in 1997—to improve the safety of the health care system for the patients and families it serves. NPSF is unwavering in its focus on uniting disciplines and organizations across the continuum of care, championing a collaborative, inclusive, multi-stakeholder approach. NPSF is an independent not-for-profit 501(c)(3) organization based in Boston, Massachusetts.



^{*} Transforming healthcare: a safety imperative. Leape L, Berwick D, Clancy C, et al., for the Lucian Leape Institute at the National Patient Safety Foundation. *Qual Saf Health Care*. Dec 2009; 18(6):424–428. Available at: <http://qshc.bmj.com/content/18/6/424.full>

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The Lucian Leape Institute at the National Patient Safety Foundation gratefully acknowledges
The Doctors Company Foundation
for its generous support of the LLI Expert Roundtable on Reforming Medical Education
and of the publication and dissemination of this white paper.



PREFACE

First do no harm. This centuries-old admonition—attributed to Hippocrates in the 4th century BC—was directed to physicians, presumably both as practitioners and as teachers.¹ It was more prophetic than anyone could have imagined. And it could today be directed to any health care professional, any provider organization, or indeed any country responsible for the design and delivery of health care for its citizens.

This is because history shows that Hippocrates' admonition—at least in terms of outcomes—has largely been ignored. Thus, in the 1850s, Florence Nightingale is heard complaining vehemently about the unsafe patient care circumstances at the Crimean War front.² In the same era, Ignaz Semmelweis challenges his colleagues to wash their hands in order to prevent puerperal sepsis and is committed to a mental institution.³ Semmelweis' urgings would be very much in place today, for the simple failure of health care practitioners to wash their hands now accounts for tens of thousands of health care-associated infections each year. And finally there is Ernest Amory Codman setting forth his End Results Thesis in 1910, wherein he frames the obligation of physicians to study the outcomes of the care they provide, take action to remedy their errors, and make public their results.⁴ For his cutting-edge posture, Codman was ostracized by his colleagues, died a pauper, and is buried in an unmarked grave in Boston.

It would be a number of decades before efforts were undertaken to actually study and codify the depth and scope of the patient safety problem. This work began with the Harvard Medical

Practice Study in the 1980s, which found that 4% of hospitalized patients were injured and that two-thirds of those injuries were preventable.⁵ In 1999, the Institute of Medicine report *To Err Is Human* extrapolated from this work and a subsequent study to estimate that there were between 44,000 and 98,000 preventable deaths in the U.S. each year.⁶ Although these figures were challenged by skeptics, subsequent similar studies and reports in the United Kingdom, Canada, Denmark, New Zealand, and Australia, among others, found much higher rates, which led the World Health Organization to conclude that serious preventable adverse events occur—on average—during one out of every ten patient hospitalizations in developed countries around the world.⁷

Recognition of the gravity of the continuing patient safety problem has led to improvement initiatives in many countries. In the U.S., the National Patient Safety Foundation has worked with stakeholder groups for over a decade to advance patient safety learning and bring forward new solutions.⁸ The Agency for Healthcare Research and Quality has invested in defining measures to assess patient safety and in the development of its Patient Safety Improvement Corps.⁹ The National Quality Forum has certified a series of safe practices and is leveraging their implementation.¹⁰ The Joint Commission has issued a set of National Patient Safety Goals and requires compliance with these requirements for accreditation purposes.¹¹ The Institute for Healthcare Improvement has launched two major national campaigns to inspire thousands of hospitals to adopt specified safe practices.¹² And there is more.

Nevertheless, health care in this country remains unsafe. Although no one intends to harm recipients of care, health care practitioners and provider organizations unwittingly harm and sometimes cause the death of patients every day. For example, the Centers for Disease Control and Prevention conservatively estimates that there are at least 2 million hospital-acquired infections each year and that these infections lead to approximately 90,000 deaths.¹³ Medication errors harm 1.5 million people each year, 400,000 of these in hospitals.¹⁴ Twenty percent of hospitals fail to conduct time outs before surgery, an effort known to be important in preventing the remarkably frequent occurrences of wrong-site surgery.¹⁵ Further, almost twice as many hospitals do not have effective processes for timely reporting of critical test results. And there are many more examples.¹⁵

As other industries have learned, achieving safety in the work environment requires much more than implementing new rules and procedures. It requires the development and sustainment of cultures of safety that engender trust and embrace reporting, transparency, and disciplined practices. It also requires an atmosphere of respect among the health care disciplines and a fundamental ability of all practitioners to work together in teams. And it begs the need for practitioners, particularly physicians, who have the knowledge, skills, and attitudes necessary to support, and even lead, the creation and perpetuation of cultures of safety.

In all fairness, there are other significant barriers to improving patient safety. These include the current flawed payment system whose “rewards” sometimes undermine safety improvement efforts while failing to pay for others; the existing dysfunctional medical liability system which chills reporting of adverse events and their underlying causes; apparent public policy confusion over the treatment of reported or discovered adverse health care events; and long-delayed and probably still insufficient federal investment in electronic health records.

Thus, the need to address health professional education is not the only patient safety improvement challenge that this country faces, but many believe that it is the foremost challenge among equals. For if these other barriers are overcome and health professional education remains unchanged, meaningful improvements in safety cannot and will not happen. Simply stated, health professional education needs to be re-designed to equip students with the knowledge, skills, and attitudes they need to function safely and effectively in health care delivery in the 21st century. While this need exists across the health professions, it is most compelling in medical education because the actions of physicians and their decisions largely determine the care that all other health care professionals provide.



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EXECUTIVE SUMMARY

Health care delivery continues to be unsafe despite major patient safety improvement efforts over the past decade. The Roundtable concluded that substantive improvements in patient safety will be difficult to achieve without major medical education reform at the medical school and residency training program levels. Medical schools must not only assure that future physicians have the requisite knowledge, skills, behaviors, and attitudes to practice competently, but also are prepared to play active roles in identifying and resolving patient safety problems. These competencies should become fully developed during the residency training period.

Medical schools today focus principally on providing students with the knowledge and skills they need for the technical practice of medicine, but often pay inadequate attention to the shaping of student skills, attitudes, and behaviors that will permit them to function safely and as architects of patient safety improvement in the future. Specifically, medical schools are not doing an adequate job of facilitating student understanding of basic knowledge and the development of skills required for the provision of safe patient care, to wit: systems thinking, problem analysis, application of human factors science, communication skills, patient-centered care, teaming concepts and skills, and dealing with feelings of doubt, fear, and uncertainty with respect to medical errors.

In addition, medical students all too often suffer demeaning experiences at the hands of faculty and residents, a phenomenon that appears to reflect serious shortcomings in the medical school and teaching hospital cultures. Behaviors like these that are disruptive to professional relationships have adverse effects upon students, residents, nurses, colleagues, and even patients. Students frequently tend to emulate these behaviors as they become residents and practicing clinicians, which perpetuates work environments and cultures that are antithetical to the delivery of safe, patient-centered care.

The LLI Expert Roundtable on Medical Education Reform makes the recommendations set forth below.

Setting the Right Organization Context

Health care has undergone a major sea change over the past two decades. As these changes and the complexities of health care have escalated, patient safety problems have become increasingly evident, and medical education and training institutions have found themselves struggling to keep up with the need to assure that student physicians are properly equipped with the skills, attitudes, knowledge, and behaviors

(i.e., patient safety competencies) that will make them capable of becoming part of the patient safety solution. This need constitutes a major challenge to medical schools and teaching hospitals, and particularly their leaders and faculty, to develop their own competencies to guide their charges in learning to manage a new “disease state.”

Recommendation 1. Medical school and teaching hospital leaders should place the highest priority on creating learning cultures that emphasize patient safety, model professionalism, enhance collaborative behavior, encourage transparency, and value the individual learner.

Recommendation 2. Medical school deans and teaching hospital CEOs should launch a broad effort to emphasize and promote the development and display of interpersonal skills, leadership, teamwork, and collaboration among faculty and staff.

Recommendation 3. As part of continuing education and ongoing performance improvement, medical school deans and teaching hospital CEOs should provide incentives and make available necessary resources to support the enhancement of faculty capabilities for teaching students how to diagnose patient safety problems, improve patient care processes, and deliver safe care.

Recommendation 4. The selection process for admission to medical school should place greater emphasis on selecting for attributes that reflect the concepts of professionalism and an orientation to patient safety.

Strategies for Teaching Patient Safety

Medical schools have done an excellent job of providing students with the knowledge and related skills they will need for the technical practice of medicine. However, the new and still evolving care environment requires more than this with respect to patient safety. The elemental nature of patient safety education has profound implications for future curricular design. The teaching of patient safety needs to begin on Day 1 of medical school and be extended throughout the four-year medical school experience and beyond by becoming embedded in all teaching activities. It is equally important to understand that patient safety education is much more than the absorption of concepts and knowledge and requires particular attention to the acquisition of desired skills, attitudes, and behaviors. This is because the long-term intent is that these skills, attitudes, and behaviors become an integral of the physician’s professional way of life.

Recommendation 5. Medical schools should conceptualize and treat patient safety as a science that encompasses knowledge of error

causation and mitigation, human factors concepts, safety improvement science, systems theory and analysis, system design and re-design, teaming, and error disclosure and apology.

Recommendation 6. The medical school experience should emphasize the shaping of desired skills, attitudes and behaviors in medical students that include, but are not limited to, the Institute of Medicine and Accreditation Council for Graduate Medical Education (ACGME)/American Board of Medical Specialties (ABMS) core competencies—such as professionalism, interpersonal skills and communication, provision of patient-centered care, and working in interdisciplinary teams.

Recommendation 7. Medical schools, teaching hospitals, and residency training programs should ensure a coherent, continuing, and flexible educational experience that spans the four years of undergraduate medical education, residency and fellowship training, and life-long continuing education.

Leveraging Change

There is today apparent growing interest among medical school faculty and students in understanding and teaching patient safety. Many of the current efforts involve limited courses, but some schools are pursuing much more aggressive and elaborate patient safety education and training initiatives. However, the progress is uneven at best and still non-existent in some schools, while the urgency to train physicians to become patient safety problem-solvers and leaders is great. This requires attention to formulating strategies that are likely to leverage acceleration of the desired changes set forth in this paper. Among the potential strategies, modernization of the Liaison Committee on Medical Education (LCME) and ACGME standards appears to offer the greatest opportunity to create universal substantive positive change. In addition, public monitoring of school efforts in making these changes is another potentially strong lever. Other opportunities exist as well.

Recommendation 8. The LCME should modify its accreditation standards to articulate expectations for the creation of learning cultures having the characteristics described in Recommendation 1 above; to establish patient safety education—having the characteristics described herein—as a curricular requirement; and to define specific terminal competencies for graduating medical students.

Recommendation 9. The ACGME should expand its Common Program Requirements to articulate expectations for the creation of learning cultures having the characteristics described in Recommendation 1; to emphasize the importance of patient safety-related behavioral traits

in residency program faculty; and to set forth expected basic faculty patient safety competencies.

Recommendation 10. The LCME and the ACGME should direct particular attention to the adequacy of the patient safety-related preparation of graduating medical students for entry into residency training.

Recommendation 11. A survey of medical schools should be developed to evaluate school educational priorities for patient safety, the creation of school and teaching hospital cultures that support patient safety, and school effectiveness in shaping desired student skills, attitudes, and behaviors.

Recommendation 12. Financial, academic, and other incentives should be utilized to leverage desired changes in medical schools and teaching hospitals that will improve medical education and make it more relevant to the real world of patient care.



INTRODUCTION

Recent studies in multiple countries—stimulated by the Institute of Medicine’s (IOM) *To Err Is Human* report in 1999—have found pervasive patient safety problems in hospitals and other health care settings around the world.^{6, 16-19} Although awareness of this problem is growing dramatically, there has been uneven and slow progress in improving patient safety since the issuance of the IOM report.^{20, 21}

Among the challenges involved in achieving tangible improvements in patient safety, none is more daunting than the need for major alterations in the educational preparation of health professional students.²² While this need exists across the health professions, it is most compelling in medical education.²³

Medical education in the United States needs to be substantially restructured to enhance the development of skills, behaviors and attitudes that students will need as practicing physicians. These include—in addition to the crucial ability to manage clinical and scientific information—understanding of the basic concepts of human dynamics, patient safety, and systems theory, and the development of basic management, communication, and teamwork skills. To do this, it will be necessary for medical schools to reduce the current intensity of their focus on the acquisition of scientific and clinical facts, and for residency training programs to emphasize and assure the application of these new skills, attitudes and behaviors on a continuing basis.

Over the past ten years, the IOM, the ACGME, and the ABMS have formulated concise sets of desired practitioner competencies.^{22, 24, 25} Notably, these priorities almost uniformly focus on the acquisition of knowledge, skills, and attitudes that support desired behaviors.

These well-informed directions suggest that medical schools need to sharpen their focus on teaching concepts that underlie the behaviors for which future physicians will be held accountable. That teaching should be undertaken in an interdisciplinary fashion and capitalize on the rapidly expanding applications of simulation as a teaching tool. This approach could also benefit from utilization of the case study method—a proven method for integrating knowledge in U.S. business schools—as an integral part of the medical education process.

Because of the current lack of emphasis on patient safety education and training, today’s medical schools are producing square pegs for our care system’s round holes. Medical education must change to meet the needs of an increasingly complex and vulnerable system-based health care delivery system. A strategy is also needed for retraining those physicians whom the system has already produced. This is especially important in light of the fact that they are the mentors and role models for our future physicians.

The type of medical education reform necessary to improve patient safety in this country requires the buy-in and coordination of a variety of important stakeholders. It is these stakeholders who largely made up the composition of the Expert Roundtable. The Roundtable discussed the current shortcomings of U.S. medical education with respect to patient safety, what medical education ideally should become in the future, and what strategies should be deployed to achieve the desired changes in medical education. This white paper is the culmination of these discussions.



Part I. The Need for Medical Education Reform

Square Pegs

One of the principal conclusions reached in the IOM's *To Err Is Human* report is that the major underlying cause of adverse health events is poorly designed systems—specifically, patient care processes—as opposed to negligent individual performance.⁶ The implication of this insight is that physicians, health care managers, nurses, pharmacists, and others should work together in teams to identify and re-design flawed patient care processes to prevent human error from actually reaching patients to harm them. A major reason this is not happening is that physicians and other health care professionals have not received appropriate education and training to prepare them to function in teams to carry out this critically important work.^{22, 26}

“Medical education underwent a major transformation following release of the Flexner Report in 1910. Many believe we are at a similar transformational moment now.”

The typical medical school curriculum exemplifies the problem. Little or no instruction is provided in engineering concepts applicable to systems thinking, safety science, the science of improvement, human factors, leadership and teamwork.²⁷ Few or no opportunities are offered for applied experience in examining the patient care processes which constitute everyday practice in the real world of health care. Graduates too often lack the knowledge and interpersonal skills to relate well and communicate effectively with

co-workers, meet patient needs, and deal with their own feelings of doubt, fear and uncertainty.²³ Yet, these are precisely the knowledge and skills that most people consider essential for a physician. This awareness and these capabilities need to be embedded in the teaching of every student from the beginning of medical school.

The problem is compounded by the current focus in medical education on “courses” and content in a world of exploding medical knowledge that simply cannot be captured by a medical school curriculum, let alone by an individual medical student. In the alternative, there is much to be said for the development of skills in utilizing informatics—as recommended by the IOM—that would permit students to acquire much relevant knowledge and information on an as-needed, “just-in-time” basis.²⁸ Such an approach becomes particularly compelling in light of the reality that approximately half of the information provided to students in medical school will eventually be proven to be wrong.

Emerging Issues in Health Care

Medical education underwent a major transformation in its structure and curricula following release of the Flexner Report in 1910.²⁹ Many believe we are at a similar transformational moment now. While health care has changed dramatically over the past few decades, medical education has struggled to keep up.³⁰ Even more wrenching changes are underway, and emerging challenges will require rethinking both the content and the methods used to prepare medical students. These include changes in the organization of medical care, the changing role of the physician, the

exponential increase in medical knowledge, and the increasing involvement of patients in their care.

Changes in the organization of medical care

The U.S. health care system was designed primarily for episodic inpatient and outpatient care, but it now needs to adjust to a significant and still progressing shift in emphasis from acute care to chronic disease management. Today, the care for patients with chronic diseases is typically provided by multiple specialists, with or without a primary care coordinator, who work with other practitioners in trying to provide the care and support required by these patients. In this context, the autonomous physician model of care is not only becoming obsolete, it is hazardous because it exposes patients to increased risks associated with transitions, hand-offs, and communication failures. A different model—one that emphasizes collaborative practice and inter-professional teamwork—is needed.³¹ In this model, patients with chronic diseases become the collective responsibility of stable teams which have established role definitions and communication patterns, agreed upon goals for their patients, and clear strategies not only for achieving these goals but also for engaging patients and their families to become their own primary care providers. Health care organizations—including hospitals, nursing homes, outpatient services, and home health programs, among others—will face a growing need to become increasingly integrated to support this new model of care delivery.

The changing role of the physician

In the face of growing demands for better coordinated and integrated care, the roles of physicians are changing.³² Although the “medical home” model calls for primary care doctors to be the decision-makers and managers of all health care resources for patients, nurses and other practitioners may play central care coordinator roles in other models.³³ The Chronic Care Model, the most

widely accepted model for managing patients with chronic diseases, calls for physicians to work in inter-professional teams with nurses, pharmacists, and others to better coordinate and integrate the use of health care resources both in inpatient and outpatient settings and in the community.³¹ In any event, doctors will certainly require improved management and team skills to collaborate with specialists, nurses, pharmacists, therapists, and other practitioners across various inpatient, outpatient, and residential settings.

Increasing medical knowledge

It is impossible for doctors to master or even read all of the emerging medical information being published every week, even in their own specialty.³⁴ Doctors require different skill sets other than just being able to absorb large quantities of information. They need to recognize that they must be life-long learners who seek continuous improvement in the care they provide to patients. In addition, they must realize the value of information technology in helping them deliver up-to-date, evidence-based care, and be able to use information technology tools to find pertinent literature, review guidelines, calculate patient risk factors, and apply clinical pathways. They also need to critically appraise important studies and use literature to answer important clinical questions.

Increasing patient involvement in their care

Physicians must also learn how to involve patients in their care in a more direct manner than they ever have previously. Patients are becoming more engaged consumers of health care, seeking medical information on the internet and second opinions on treatment plans more frequently than ever before.^{35, 36} Patient consumer groups are forming to give patients a more active voice. Patients are also increasingly using disease self-management tools, and personalized health records are becoming more common.³⁷ Efforts to let patients have easy computer access to all of their medical

records are also underway. Increased openness, transparency and patient engagement are key aspects of improving patient safety. Physicians need to facilitate and lead these efforts, be able to communicate effectively with patients, be knowledgeable about their needs, and know what resources are available. Indeed, physicians must learn to have patients as partners in their own care.

Other emerging challenges in health care with implications well beyond reforming medical education can be cited. In order for physicians to meet these challenges and work effectively in a changing health care system, they must be able to work in and manage systems, manage large amounts of information, communicate effectively with patients and coworkers, and place patients' needs first. Most importantly, they need to feel they have the skills necessary to provide good care and adapt to new challenges.

When Things Go Wrong

We now realize that when a serious patient safety misadventure occurs, there are two victims. The first of course is the patient. The second—less frequently recognized—is the practitioner who was at the sharp end of the failed care delivery process, i.e., the person who actually committed the act that harmed or killed the patient.^{38, 39}

The practitioner becomes a victim because s/he likely is commonly providing care in a “shame and blame” environment that has little tolerance for patient care failures attributable to human error. Further, the practitioner—if a physician—has been acculturated in an education and training environment that views the physician as being at the top of the care hierarchy and therefore the accountable party.⁴⁰ In this framework, all good outcomes are attributable to the individual physician and, similarly, all bad outcomes are the fault of the physician. Such perceptions quite clearly overlook the roles of other health care team

members and the importance of flawed patient care processes that permitted the physician's error to actually reach and harm the patient.⁴¹

“We now realize that when a serious patient safety misadventure occurs, there are two victims.”

The upshot of physician demoralization in the wake of a serious adverse event is an individual who may be psychologically unable to participate in the ensuing analysis, diagnosis and resolution of the failed patient care process(es).³⁸ For example, s/he may have little insight into “what really happened” and be unable to empathize and communicate effectively with the injured and frightened patient.⁴² S/he also may lack the knowledge and skills necessary to work with other team members to investigate the occurrence and analyze and re-design the relevant care processes to prevent similar circumstances from recurring in the future.

This in a nutshell is the problem at hand.

The Medical Education Culture

Much of what is right and wrong with medical education can be traced to the organizational—school and teaching hospital—cultures in which education and training are provided. Outside of the military, health care settings are among the most hierarchical in American society. In these settings, students, residents, nurses, pharmacists, and other health care workers are often intimidated by physicians and reluctant to question decisions or offer alternative views.⁴³ These are the frameworks in which student values, attitudes and behaviors are shaped.

The science content-packed curriculum reinforces these frameworks by its emphasis on the acquired

knowledge and primacy of the individual physician and his/her judgment. This leaves little room in the curriculum for developing the skills, attitudes, and behaviors needed for collaborative practice and for the provision of safe care.⁴⁴

“Professional egocentricity inhibits team-building across disciplines.”

Culture change comes slowly to medical schools and teaching hospitals because the underlying cultural beliefs and values are intertwined with longstanding traditions and behaviors that pervade the medical school and teaching hospital continuum.

One might argue that much of what constitutes the medical school culture is good or, if not good, harmless enough. But there are elements of this culture that are not harmless. For example, the creation of professional egocentricity is a problem because it inhibits team-building across disciplines and fails to acknowledge that most care is provided by teams of individuals, some of which are not led by physicians. Shortcomings in achieving cultures of safety in teaching hospitals and other care delivery settings are widely recognized and are the subject of ongoing improvement efforts by The Joint Commission and the Institute for Healthcare Improvement, among others.^{11, 45}

One of the more serious problems at the school and hospital levels is that some student clinical experiences are dehumanizing. This is sometimes seen as an element of what has been referred to as the “hidden curriculum.”⁴⁴ Simply put, students assimilate the values, behaviors and attitudes of their mentors. Most often these are positive experiences, but occasionally students are exposed to and adopt unprofessional behaviors. In a survey of third-year medical students, student observation of and accommodation to unprofessional behaviors progressively increased during the first five

months of clerkships.⁴⁶ Initially critical of these behaviors, students increasingly perceived them to be appropriate as training progressed, and steadily began to emulate them.

An anonymous survey of 1,853 third- and fourth-year medical students in 1992 and 1993 at six Pennsylvania medical schools also found disheartening results.⁴⁷ Ninety-eight percent of students had heard physicians refer derogatorily to patients; 61% had witnessed what they believed to be unethical behavior by other medical team members and, of these students, 54% felt like accomplices. Many students reported dissatisfaction with their actions and ethical development: 67% had felt badly or guilty about something they had done as clinical clerks, and 62% believed that at least some of their ethical principles had been eroded or lost. Controlling for other factors, students who had witnessed an episode of unethical behavior were more likely to have acted improperly themselves for fear of poor evaluations. Moreover, students were twice as likely to report erosion of their ethical principles if they had behaved unethically for fear of poor evaluation or to fit in with “the team.”

More worrisome still are the student accounts of disrespectful behavior and abuse on the part of faculty. The survey of graduating medical students conducted annually by the Association of American Medical Colleges (AAMC) finds significant numbers of medical students who feel that they have experienced some form of abuse or disrespectful behavior during their education and training.⁴⁸ For the most recent five-year period for which data are available (2004–2008), the number of students who answered “Yes” to having been “publicly belittled or humiliated” ranged from 12.7% to 16.7%, with non-white and female respondents reporting higher rates.⁴⁹ Approximately half of these students report the frequency of such abuse as occurring “Occasionally,” while a much smaller

fraction (5%) report these events as occurring “Frequently.” The most common sources of this abuse were clinical faculty and residents (66% and 67%, respectively) followed by smaller but significant percentages of nurses and patients (multiple responses to this question allowed). Abusive behavior can be as subtle as making a student feel foolish for asking a question or as overt as throwing surgical instruments in the operating room. Some may argue that an overall 12–17% rate of abusive and disrespectful behavior over the four-year medical school experience is not so extraordinary, but the rate ranges far higher in some schools. Even then, it is hard to imagine any successful industry or company that tolerates abusive behavior at any level.

In order to capture some examples of the problem of abusive and disruptive behavior, a medical student member of the Roundtable solicited anonymous stories from medical students who had experienced disruptive or abusive behavior. A sampling of these poignant stories is provided in Table 1.

Disruptive, abusive and disrespectful behaviors are more than simply a problem in communication between two individuals.⁵⁰ Such behaviors create a culture of fear and intimidation, diminish individual and collective pride and morale, impair learning, and sap joy and meaning from work. This is the stuff of which shame and blame environments are made. Further, disruptive and abusive behaviors are contagious.⁴⁶ Abused students, residents and nurses perpetuate dysfunctional health care organization cultures by modeling the demeaning and disrespectful behaviors to which they were exposed and passing these behaviors along to the next generation of learners.

Breaking this cycle and changing this culture of fear and intimidation to a culture that facilitates and reinforces learning is the responsibility of organization leaders. In education and training settings, these are primarily medical school deans,

teaching hospital CEOs, department chairs, and residency program directors.

Selecting for What?

Medical schools have long sought to attract “the best and the brightest” to become future physicians, and they have largely succeeded in this endeavor. But today there are growing questions as to whether this description of what is desired in a medical school applicant is sufficient.

At the initial international gathering of the Patients for Patient Safety program of the World Alliance for Patient Safety in London several years ago, a spontaneous comment ignited a consensus among the patient attendees that what they want their physicians to be is not the best and the brightest.⁵¹ What these patients—many of whom had personally suffered the consequences of preventable adverse events—wanted was doctors who are competent, listen to patients, are empathetic and compassionate, and communicate effectively with patients. Their message was simple: there is more to being a good physician than academic achievement.

Over the past decade, medical school interest in selecting for interpersonal skills and attributes that reflect the concepts of professionalism has been growing. The most prominent effort in this regard has been the development and application of a Multiple Mini-Interview (MMI) process at the Michael DeGroote School of Medicine at McMaster University.⁵² The MMI consists of brief interviews of each applicant student at a series of at least nine structured clinical examination stations at which the applicant is presented with scenarios that require him or her to discuss a health-related issue with an interviewer. In this process, applicants literally rotate through a group of individual interviewers who cover domains such as ethics, professionalism, and interpersonal relationships, among others. MMI results over the past six years have demonstrated high correlations

TABLE 1. Disrespectful or Abusive Behavior Examples Observed or Experienced by Medical Students

Example 1. Two second-year medical students spent an afternoon observing surgery in the OR as part of a medical school course. The Chief Surgical Resident assigned the students to a corner of the room with instructions to be quiet and not touch anything. After the students had washed their hands and moved to their assigned place, the Attending Surgeon noticed them and yelled: “Who are you? What are you doing in this OR? When you come into an OR you introduce yourself to the surgeon. And why are you standing there? Go stand in that (pointing to a different) corner.”

Example 2. One third-year medical student was scrubbed in for a case, observing and occasionally assisting the surgeon. At one point, she noticed the surgeon pulling a retractor in a way that seemed to indicate that the surgeon wanted her to take over retracting. As she reached to grab the retractor, the surgeon, who apparently didn’t want her assistance, slapped her hand out of the field instead of verbally instructing her to remove her hand.

Example 3. From a female third-year medical student on Surgery rotation: I had an attending who told me he was excited that I would be a grad student the following year because I would technically *not* be a med student anymore. Then he specifically said that he was thinking some very non-PC things in his head once he learned about this—to my face. Made me feel very uncomfortable.

Example 4. From a third-year medical student on OB/GYN rotation: I was instructed to observe a hysterectomy, but when I arrived to the OR, the doctor looked at me with disdain and told me to stand in the far corner and not mess anything up. So, I perched myself atop a small step-stool in the back corner of the room, and I spent the next 3 hours squinting from across the room, completely

unable to see anything except for blue-gowned backs.

Suddenly, the doctor called out, “You, over there!” I looked over in surprise—me? Apparently, there was no one available to pull out the catheter, and they beckoned for me to approach the table. I cautiously approached, and before I could even begin, the doctor sharply barked, “DON’T mess this up for me!” Shaking, I followed her instructions, and managed to remove the catheter without contaminating the sterile field. “Now, GET OUT of the way!” she yelled. I couldn’t see behind me, and in a small tremulous voice, I asked, “Is it okay to move backwards, I can’t see anything behind me...?” Raising her voice up a notch, she yelled, “Just GET OUT!” I took several hasty steps backwards, and my arm grazed lightly against the side of a table holding sterile instruments—mind you, no where *near* the table-top, where the instruments lay, but just on the side curtain—and a nurse shrieked “She contaminated the whole sterile field!” With fury, the doctor looked up and spat, “Fuck you!” I blinked, and stared right back at her—really, did she just actually say that? Although I didn’t feel sad at all—only mad as hell—tears rushed to my eyes in a visceral response to all of the shouting. The instant that the curse left her lips, I could tell that she regretted it, but you can’t take back something like that, so the words hung awkwardly in the air, hovering over all of our heads for the rest of the procedure.

She tried to make up for it, sending arbitrary, irrelevant compliments in my direction, and the nurse patted me on the shoulder several times and tried to appear motherly and compassionate. But, what I remember most strongly from the experience—what I *still* cannot believe—is the fact, despite their palpable remorse, no one ever said, I’m sorry.”

both with clinical performance and with national licensing examination results. The MMI process is now used widely in Canadian medical schools and in some U.S. schools.

Just as relevant in the selection process is the avoidance of potential students with serious psychosocial disorders and other undesirable traits. Too often, these individuals, once admitted to medical school, become those difficult-to-extrude “problem students” who continue to slip through the system to become “problem doctors.” All of this begs the need for more effective applicant screening mechanisms. Some progress has been made in developing formal personality screening methods, but greater efforts are needed in developing and/or refining appropriate tools.⁵³

“If physicians are not providing patient-centered care, what kind of care are they providing?”

Core Competencies: The Missing Link

In 2003, the Institute of Medicine issued a sharply critical report on health professions education that outlined five core competencies which all health professionals should be able to demonstrate.²²

Although the report did not single out the medical profession, the text of the recommendations made clear that medical education was very much front of mind as the core competencies were developed.

Most would agree that the core competencies suggested by the IOM are rather straightforward. They include the following:

- The provision of patient-centered care
- The ability to work in inter-disciplinary teams
- Employment of evidence-based practices
- Application of quality improvement concepts
- Utilization of informatics

Six years later, there are serious questions as to whether the competencies of today’s graduating physicians fully meet any of these objectives. Perhaps even more to the point, we should ask why the IOM found it necessary to frame such basic recommendations. For example, if physicians are not providing patient-centered care, what kind of care are they providing? Or if physicians are not practicing evidence-based medicine, what kind of medicine are they practicing? These are not silly questions. They are compelling acknowledgements of serious problems.

The provision of patient-centered care is of course not so simple.⁵⁴ It involves working with the patient as a partner and often as shared decision-maker, the ability to develop long-term relationships with patients that underpin the successful management of chronic conditions, and cultural and racial sensitivities, among others. The dimensions of patient-centered care also include the ability to communicate at the patient’s level of understanding, the willingness and ability to provide timely and effective relief of pain, and the simple ability to listen and actually hear the patient.⁵⁵ Finally, physicians need to grasp what the experiences of illness and hospitalization are like from the perspective of the patient. How much time and effort are being devoted to developing these and other related skills in medical schools today? And, as importantly, how well do student role models—the faculty and residents—perform against these expectations?

Teamwork is another competency often overlooked at the medical school level.²² Many schools seem to think that this set of skills should be developed at some point following medical school graduation and thus miss multiple opportunities for inter-disciplinary education and training with nursing, pharmacy and other types of students. This omission is even more striking today in the face of the expanding array of teamwork simulation exercises. The hard reality is that

delivering effective care in a variety of clinical settings is all about the ability of the participants to work together as a team.

The failure to employ evidence-based practices across the continuum of patient care is a long-standing problem that will be further challenged by the emerging comparative effectiveness initiatives.⁵⁶ The schools have a clear role in teaching students to become scholarly critics of “accepted practices” and of the clinical literature. Such training should also include the development of at least a basic understanding of the Cochrane criteria and their application.²⁸

The application of quality improvement (QI) concepts encompasses a multi-dimensional set of skills.⁵⁷ In its most basic applications, however, quality improvement is about understanding the fundamental roles of measurement. These include problem identification, the setting of priorities for improvement interventions, and the eventual determination as to whether a QI intervention has been successful.

Since most students today enter medical school with at least a fundamental appreciation of informatics and its applications, this fifth and final basic problem area is one that has the potential to solve itself over time. But the schools have a role to play as well. The medical school faculty have traditionally placed their heaviest curricular emphasis on the transmittal of what some view as excessive amounts of fact-based information to students. Today, that may be occurring at the expense of developing skills and behaviors that are of at least equal importance in the preparation of the complete physician. Thus, medical schools could become part of this solution by re-balancing their current curricular emphases and teaching students how to utilize existing informatics capabilities to acquire much of the information they need when they need it (“just in time”) to support effective clinical decision-making.

What is notable about the foregoing five competencies is they describe desired behaviors and skills as opposed to particular knowledge bases. This strong behaviors and skills emphasis is further reflected in an additional set of physician-specific core competencies that have been promulgated by the ACGME and ABMS.^{24, 25} These competencies, which build on those set forth by the IOM, include the following:

- Patient care. The ability to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health
- Medical knowledge. Demonstration of knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care
- Practice-based learning and improvement. Demonstration of the ability to investigate and evaluate the care of one’s own patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and life-long learning
- Interpersonal and communication skills. Demonstration of interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals
- Professionalism. Demonstration of a commitment to carrying out professional responsibilities and an adherence to ethical principles
- Systems-based practice. Demonstration of an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal care

Importantly, these competencies are those that residents completing training and physicians maintaining board certification will be expected to demonstrate on a continuing basis. For medical schools, this places the pressure for education and training reform much closer to home, especially

“Missing from the typical medical school curriculum is substantive attention to safety science, systems thinking, the science of improvement, human factors, and teamwork.”

since the LCME, for its part has not yet moved to establish core competencies for graduating physicians. Rather, this task has been left to the determination of the individual medical schools.

Educational Content and Methods Through a Different Prism

Experts agree that patient safety is predominantly about the proper design of health care systems and patient care processes. This thesis was the main thrust of the IOM’s *To Err Is Human* report and is now widely accepted in the health care community. In the engineering community, this has never been news at all.⁶

Unfortunately, system design failures continue to translate into preventable patient deaths every day. Thus, one would expect that teaching the prevention of iatrogenic patient deaths would be among the highest priorities in medical schools, but sadly it is not. Missing in part, or totally, from the typical medical school curriculum is substantive attention to safety science, systems thinking, the science of improvement, human factors, and, as previously noted, teamwork.⁵⁸ In the clinical setting, those who will be called upon to analyze, diagnose, and re-design flawed patient care processes are those whose work is most affected by these processes—physicians, nurses, pharmacists, and other health professionals. Today, these individuals are unable to fix what they do not understand. Tomorrow, that must—with some urgency—change.

The need to understand basic error science and human factors science and their applications bears particular mention.^{59, 60} For the student, this is an important opportunity to learn, in an applied

fashion, about the interactions among systems, individuals and their environments. If nothing else, this experience should provide significant insights into cognitive dissonance, human fallibility, and the importance of being humble. Students who gain a basic understanding of human factors theory should, for example, come to appreciate the significance of sleep deprivation and fatigue in the generation of errors.

Of equal importance is the art of communication, which has already been referenced as one of the ACGME/ABMS core competencies. In the Joint Commission’s Sentinel Event Database, the most common underlying cause of serious adverse events resulting in death or permanent loss of bodily function is communication failure.⁶¹ Communication failures come in many forms—failure to recognize language or health literacy barriers to patient/family understanding, failure to read back verbal orders, failure to transmit important patient information when handing a patient over to the care of another physician, untimely reporting of critical test results, and inappropriate use of abbreviations in writing patient orders, among others.

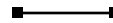
Communication skills are also often found wanting when physicians need to talk with a patient and/or a patient’s family following a preventable adverse event.⁶² What most patients and patient families want is an acknowledgement that a preventable adverse event occurred, a commitment to thoroughly investigate what happened, a commitment to take appropriate steps to prevent future occurrences, and an apology. That, however, may prove to be a tall order for a physician lacking specific training in the development of communication skills, especially those relating to apology.

Some medical schools have taken initial steps to incorporate some of this fundamentally different content into their curricula, but this is proving to be no small challenge.⁶³ First, this content is as much or more about the acquisition of appropriate skills, attitudes, and behaviors as it is about acquiring new knowledge. Thus, substantive evaluation of students in this realm involves approaches that require the student to demonstrate observed mastery of these concepts in simulated or other clinical settings or through other emerging evaluation methods.

In addition, relatively few faculty are skilled in teaching patient safety-related content, and such educational efforts are all too often not valued by other faculty, department chairs, and even the dean.⁶⁴ Further, students who do develop patient

safety awareness, knowledge and skills may find themselves ignored or put down by faculty when they try to apply these new competencies.

Meanwhile, some schools are beginning to introduce students to faculty from other relevant disciplines such as engineering and management. Similarly, case studies and simulation applications are beginning to be used for skill development in some schools. However, such exposures are today most notable for being the exceptions that they represent.



Part II. What Changes Are Needed

Creating the Right Culture

Culture is defined as the customary beliefs, values, and behaviors shared by members of a group (e.g., the faculty of a medical school). The challenge involved in changing culture is embodied in this definition. Beliefs, values and behaviors are difficult to change because they are often intertwined with long-established professional traditions and reward systems. This does not mean that culture change is impossible, but such change does require unwavering leadership engagement and persistence. Culture change is a journey, not a specific action or set of actions.

“The changes we envision cannot happen without leadership by the dean.”

Much has been written about the key characteristics of the ideal patient safety culture in hospitals.⁶⁵⁻⁶⁷ These include strong leadership (including the setting of the right examples: “walking the talk”); organization competence in care process design and re-design; transparency; active engagement of patients and their families in patient care and problem-solving processes; resource investment that tracks the organization’s cultural objectives; and reward mechanisms that encourage and incent desired behaviors, among others. Such characteristics also include the “psychological safety” for clinicians and others to report errors while, at the same time, not tolerating deliberate unsafe acts by individuals (sometimes referred to as a “just culture”).^{68, 69} Most of these descriptors

apply to the medical school and teaching hospital cultures as well, to wit:

Leadership. Views vary widely as to the power and authority of the medical school dean to achieve major change across the school. However, the changes we envision cannot happen without leadership by the dean. Some also worry about the diffusion of leadership in many medical schools. But that diffusion can be a strength if consensus is achieved among those who have leadership roles (e.g., department chairs) in determining what the school’s goals, values and priorities should be in the new health care climate. The same accountabilities apply to teaching hospital CEOs and hospital staff leaders.

The top leadership priority should be to create a culture of learning at all levels. This means, among other considerations, that teaching skills are highly valued and that teachers consistently emphasize that patients come first. In this context, students and indeed residents provide care to patients primarily in furtherance of their education as opposed to the simple provision of service. In addition, there is mutual respect among all of the participants in the education and patient care processes (“the members of the team”) and zero tolerance for confirmed egregious abusive and disruptive behaviors that demean and dehumanize the educational experience of those who stand low in the hierarchy.

Faculty competencies. Most faculty members work conscientiously to keep up with and acquire new knowledge that is relevant to their responsibilities, but the emergence of the priority to teach patient safety content and skills is a challenge of a different kind. This is primarily because the

teaching of skills and behaviors requires the application of non-traditional educational approaches and evaluation methods. Schools need to identify or acquire faculty who are expert in teaching patient safety. Such faculty may include non-MD doctorate-level individuals who have expertise in human factors, safety science, or communications, among other areas.

At the same time, it is important to be aware that patient safety applications pervade all of medicine's domains. This means that almost all schools and teaching hospitals will need to face up to the need for a broad-based effort to educate all or most of the current faculty on the basics of patient safety. At a minimum, this continuing education initiative needs to address the science of safety, systems theory and analysis, care process evaluation and re-design, human factors, teamwork, communication skills, and error disclosure and apology. Development of such knowledge and skills will permit the faculty themselves to become creators and integrals of high-reliability clinical environments.

Safe reporting of adverse events. If students are to be taught about patient safety and the importance of the learning and eventual change that comes from analyzing adverse events, it is essential that they become facile and feel comfortable (“safe”) in identifying, reporting and discussing preventable adverse events and other patient safety problems with their peers and the faculty. In so doing, students may also find meaningful opportunities to become engaged in the teaching hospital's patient safety initiatives.

All of this requires a receptive, concerned and supportive faculty and a hospital environment that embraces the characteristics of an ideal or “just” patient safety culture. That specifically also includes the provision of support to those—students, residents, faculty, and other caregivers—who have been directly involved in a preventable adverse occurrence, as well as a willingness to

share adverse event root cause analysis findings and improvement actions taken across the organization. Such a culture may actually ease the tension between individual accountability and a sense of safety to report errors and create opportunities for learning and constructive remediation.

“Every teacher must be the kind of physician we want our students to become.”

Recognition and rewards. One of the greatest needs in today's academic health centers is stronger emphasis on and rewards for teaching skills. To all appearances, the idealized and longed-for “master teacher” is more an imagined figment than a reality in many medical schools. That simply must change, especially in anticipation of the important new responsibilities that need to be placed on the shoulders of the faculty. Existing recognition and rewards systems could serve this need if properly applied. This would include enhanced financial support (salary level, staff resources) for those who devote themselves primarily to teaching activities; modification of promotion pathways to recognize teaching skills and achievements; and the creation of mechanisms to validate the importance of the work of the teaching faculty.

In this schema, the opportunities also exist both to reward particular efforts such as inter-disciplinary teaching and to exclude from teaching activities those who marginalize themselves by virtue of their behavior, their unwillingness to be further educated, their ineffectiveness as teachers, or other dissonant expressions of “academic freedom.” Being afforded the opportunity to teach students should be regarded as a privilege that is maintained through ongoing commitment and demonstrated excellence in performance. In the end, every teacher must be the kind of physician we want our students to become.

Resource investment. In the world of academe, as elsewhere, money talks. The investments made by medical school leaders in the educational enterprise are unambiguous statements of priorities. Enhancing patient safety teaching capabilities is a critical need, and it will require new resources. These are likely to include new faculty, an investment in existing faculty education, new curricular materials, and new training and evaluation capabilities, such as simulation laboratories and Observed Structured Clinical Examination (OSCE) capabilities.

Recommendation 1. Medical school and teaching hospital leaders should place the highest priority on creating learning cultures that emphasize patient safety, model professionalism, enhance collaborative behavior, encourage transparency, and value the individual learner.

- a. Medical school deans, teaching hospital leaders, and other faculty should work to eliminate hierarchical authority gradients that intimidate others and stifle teamwork.
- b. Medical school deans, teaching hospital leaders, and other faculty should emphasize that professionalism means, among other things, demonstrating mutual respect and non-tolerance for abusive or demeaning behaviors.
- c. Medical school deans and teaching hospital CEOs should declare and enforce a zero tolerance policy for confirmed egregious disrespectful or abusive behaviors on the part of faculty, staff, residents, and students.
- d. Medical school deans and teaching hospital CEOs should serve as role models for treating students with respect and dignity.
- e. Medical school deans should elevate the importance of patient safety among the faculty.

Recommendation 2. Medical school deans and teaching hospital CEOs should launch a broad effort to emphasize and promote the development and display of interpersonal skills, leadership, teamwork, and collaboration among faculty and staff.

- a. Medical school deans and teaching hospital CEOs should set behavioral expectations for both faculty and students.
- b. Every teacher must be the kind of physician we want our students to become.

Recommendation 3. As part of continuing education and ongoing performance improvement, medical school deans and teaching hospital CEOs should provide incentives and make available necessary resources to support the enhancement of faculty capabilities for teaching students how to diagnose patient safety problems, improve patient care processes, and deliver safe care.

- a. Medical schools should identify or acquire faculty who are expert in teaching patient safety (“master teachers”).
- b. All faculty must acquire sufficient patient safety knowledge and skills to permit them to function as effective student role models.
- c. Medical schools should cast the patient safety intellectual investment as a scholarly activity and meaningfully reward the effective teaching of patient safety skills.
- d. The end goal must be a cadre of faculty, residents, and students who are capable of contributing to the creation of high-reliability systems.

Recommendation 4. The selection process for admission to medical school should place greater emphasis on selecting for attributes that reflect the concepts of professionalism and an orientation to patient safety.

- a. **Although medical schools generally have highly effective selection processes, greater emphasis should be placed on selecting for interpersonal skills that promote patient safety, such as mindfulness, compassion, empathy, collaboration, and effective communication.**
- b. **Screening tools to identify sociopathic tendencies and undesirable behavioral traits in candidates for admission should be further refined and/or developed and applied.**
- c. **Medical schools should carefully monitor student behavior and intervene early if there are displays of unprofessional or maladaptive behavior.**

Re-Balancing the Curricular Equation

Medical schools have done an excellent job of providing students with the knowledge and related skills they need for the technical practice of medicine. However, the new and still evolving

“Teaching of patient safety needs to begin on Day 1 of medical school and be extended throughout the four-year medical school experience.”

care environment requires more than this in the contemporary physician. One need look no further than the IOM and ACGME/ABMS competencies to recognize the deficiencies in the skill and behavior sets of many physicians today.²⁴ What is needed in today’s medical school curriculum is concentrated attention to the task of helping students begin to develop the skills and behaviors described by the IOM, ACGME and ABMS. These competencies constitute at least a partial roadmap to future curriculum reform.

Also missing is in-depth attention to patient safety and its improvement. The critical content, skills and behaviors that relate to patient safety substantially overlap with and mirror the IOM and ACGME/ABMS competencies. This is evident, for example, in the emphasis of the competencies on mindfulness, patient-centered care, teaming, and interpersonal and communication skills. In addition, students need support in learning how to manage stress and conflict resolution and how to deal with feelings of doubt, fear and uncertainty when they are involved in an adverse event.⁷⁰ In sum, the priority for and provision of safe care is an integral part of being a good doctor.

The elemental nature of patient safety education has profound implications for curricular design. Teaching of patient safety needs to begin on Day 1 of medical school and be extended throughout the four-year medical school experience. Basic dimensions of patient safety—such as safety improvement science, systems theory and analysis, human factors concepts, and teaming—need to be addressed in defined, separate coursework—most reasonably as a first-year “basic science.” However, it is equally important that patient safety concepts be embedded in all teaching activities, including the traditional basic sciences. Formal classroom teaching should be the prelude to the development of desired skills and behaviors that are both taught and modeled by the faculty—an approach that has potential applications well beyond the teaching of patient safety.⁷¹

A discussion of what constitutes an appropriate patient safety curriculum is beyond the scope of this paper. However, several detailed patient safety curricula have been or are being developed. The most elaborate of these is the Patient Safety Curriculum Guide for Medical Schools that was developed under the aegis of the WHO World Alliance for Patient Safety.⁷² In addition, the Institute for Healthcare Improvement (IHI) has created an electronic Open School whose quality

and safety improvement curriculum is being progressively expanded.⁷³ The enthusiastic reception that has greeted this initiative has led to the rapid creation of multiple medical school-based “chapters” of the School—a clear index of the hunger of medical students for this kind of knowledge.

A more encompassing approach to patient safety curriculum development has been taken by the Patient Safety Educational Project (PSEP).⁷⁴ This international collaboration of primarily Australian and American educators has developed an educational framework that is geared more generally to the patient safety learning needs of all types of health care workers. Finally, the Telluride Interdisciplinary Roundtable, sponsored by the University of Illinois at Chicago (UIC) and the Southern Illinois University School of Medicine (SIU), has developed general curricular principles and identified essential elements of an effective patient safety curriculum.⁷¹ The orientation of these latter patient safety curriculum development efforts is clearly multi-disciplinary and underlines the importance of medical school leadership in identifying inter-disciplinary education and training opportunities as the foundation for future teamwork development activities.

The bridging of education and training across professional schools also raises the possible desirability of inviting contributions to the medical school curriculum from related academic disciplines such as engineering, sociology and management. These disciplines, at the least, offer content and skill development enrichment capabilities that are highly germane to patient safety teaching. There are other examples as well.

Recommendation 5. Medical schools should conceptualize and treat patient safety as a science that encompasses knowledge of error causation and mitigation, human factors concepts, safety improvement science, systems theory and analysis, systems design and re-design,

teaming, and error disclosure and apology.

a. Opportunities should be identified to integrate other relevant disciplinary teaching that relates to patient safety—such as engineering, management, and sociology—into the medical school curriculum.

Teaching Methods

The medical school lecture hall is not going to disappear as a teaching venue anytime soon, nor should it. Basic science and clinical lectures provide the core knowledge that underpins clinical insight and judgment, diagnostic acumen, and sound decision-making at the bedside. The conveyance of basic knowledge is also, as noted above, prelude to development of important skills and behaviors that will permit physicians to function as architects of quality and safety improvement in the future.

However, there are other existing venues that could and should evolve to become effective patient safety teaching forums. Classic among these is the traditional Morbidity and Mortality (M and M) Conference.⁷⁵ Though long a symbol of medicine’s old shame and blame culture, M and M conferences offer the opportunity for thoughtful review and analysis of real patient safety occurrences and for the active participation of students, residents and other health care professionals, such as nurses and pharmacists, in this process. Exploration of team functioning (or malfunctioning) is another potential by-product of such discussions.

Another teaching vehicle relatively new to the medical school setting but long a staple of business school teaching is the use of case studies. This problem-based learning approach capitalizes on engaging the student as an active learner and is particularly effective in teaching analytic skills. Such skills are fundamental to the systematic

review of factors that did contribute or may have contributed to preventable adverse events (root cause analysis) and to the dissection and re-design of potentially flawed patient care processes (failure mode and effects analysis).

The McMaster Medical School (Ontario, Canada) provides a unique example of an educational system based on active learning around clinical problems.⁷⁶ The intent is to train physicians to be problem-solvers and life-long learners who consistently demonstrate the abilities to work in multi-disciplinary teams and to communicate effectively with their patients. McMaster does not evaluate students through traditional examinations but rather utilizes a system that emulates actual physician practice. Primary emphasis is placed on the student's self-assessment and assessments by his or her peers. SIU is another long-time user of the problem-based learning method.

Role playing models such as Crew Resource Management (CRM) teach still other important skills and behaviors.⁷⁷ These include leadership, situational awareness, teamwork, and communication skills, particularly across authority gradients. CRM has its origins in the National Aeronautical and Space Administration (NASA) and is required training for commercial pilots in many countries. UIC is among those educational institutions that have developed a CRM training model.

Role playing and other methods for teaching problem-solving also lend themselves well to inter-professional training. The sharing of experiences among student professionals—particularly those training in medicine, nursing, and

pharmacy—early in their education and training is an especially effective way for student physicians, nurses, and pharmacists to develop team skills as well as respect for the contributions of other team members on whom they will necessarily rely in the future.²²

A further important teaching dimension is offered by the growing range of simulation applications.⁷⁸⁻⁸⁰ Simulation has established uses in teaching both basic skills, such as management of respiratory function and cardiovascular hemodynamics, and advanced clinical skills, such as management of difficult airways, tension pneumothorax, pulmonary embolism, and shock. In the medical school setting, simulation offers a significant number of potential applications in error prevention, assessment of clinical and safety-related competencies, and the development of skills in performing a wide variety of procedures. The old approach to teaching procedures—See one, Do one, Teach one—is antithetical to safe, patient-centered care. Simulation provides the opportunity for one to see as many as one would like, do as many as are necessary to demonstrate procedural competence, and leave the teaching to experts. Indeed, some argue that students should not “practice” on patients until they are found to be competent for each and every procedure that entails risk to a patient (e.g., spinal tap, drawing of arterial blood, placement of a central line).

OSCE has been used as a basic element of both medical education and evaluation for a number of years. Its principal applications have been to assess clinical skills and reasoning. The process uses individuals who are trained to respond to

“The old approach to teaching procedures—See one, Do one, Teach one—is antithetical to safe, patient-centered care. Simulation provides the opportunity for one to see as many as one would like, do as many as are necessary to demonstrate procedural competence, and leave the teaching to experts.”

questions and behaviors in standardized fashions. However, OSCEs can also be adapted to testing student assimilation of safety concepts. An OSCE station that addressed communication and management of prescription errors was introduced in 2003 at Mayo Medical School as part of the school's quality improvement curriculum.⁸¹ Key learning identified through this application included the effective use of root cause analysis, the value of collaboration with pharmacists, and enhanced ability to communicate with patients about prescription errors.

Last but certainly not least is the potential role of patient stories in teaching important patient safety concepts and interpersonal skills to medical students. These poignant and all-too-real life experience descriptions truly bring home the significance of patient safety learning and situational awareness. For their part, patients and their families are more than willing, even eager, to share their experiences in furtherance of the goal of continuous improvement in patient safety.

Recommendation 6. The medical school experience should emphasize the shaping of desired skills, attitudes and behaviors in medical students that include, but are not limited to, the IOM and ACGME/ABMS core competencies—such as professionalism, interpersonal skills and communication, provision of patient-centered care, and working in interdisciplinary teams.

- a. Desired patient safety skills, attitudes, and behaviors should be subject to the same intensity of teaching and testing as basic and clinical science content.**
- b. In addition to appropriate lectures, the patient safety educational experience should include the use of case studies, role playing, and patient stories.**
- c. Student competence to perform procedures should be developed through simulation models to the extent possible to avoid placing patients at risk.**

- d. Students should be provided training experiences that involve working with students from other professional disciplines such as nursing and pharmacy.**
- e. The acquisition of relevant patient safety knowledge and skills should be evaluated in simulated settings, such as through the use of observed clinical examinations.**
- f. Students should be encouraged to develop and/or participate in patient safety projects under appropriate faculty guidance.**
- g. Medical school deans and teaching hospital CEOs should assure the adequacy of resources necessary to the support of patient safety education and training (e.g., simulation capabilities, including both facilities and personnel).**

One Continuous Pathway

The inevitable focus on “courses” in the medical school curriculum tends to distract from the ultimate over-arching goal of producing physicians who are fully prepared to enter graduate medical training. That transition should ideally be seamless, as should the transition of students from college to medical school. With regard to the latter, there is much to be said for the arguments set forth by Dienstag that medical schools waste too much precious time in the pre-clinical years on elementary basic science education and that colleges need to devote greater efforts towards creation of coursework that integrates the relevant science preparation needed by pre-medical students.⁸² This was in fact one of the principal conclusions reached in the recent AAMC and Howard Hughes Medical Institute (HHMI) study titled “Scientific Foundations for Future Physicians.”⁸³ Suffice to say, this is one of several potential initiatives that could help to decompress the medical school course traffic jam and assure a sharper focus on producing the right end-product—a good doctor.

What is needed is some linear connectivity between a point late in the student's pre-medical preparation and his or her entrance into graduate medical education and, more to the point, some reliable guideposts for measuring or otherwise determining whether important developmental milestones are being met as the student progresses through the medical education process. In this regard, the IOM and ACGME/ABMS competencies are necessary but not sufficient. What is missing is the articulation of a set of expected medical school competencies by the LCME. That is, what do we expect the graduating medical student/physician to be able to do?

It is beyond the scope of this paper to frame a potential set of desired medical student competencies at the conclusion of, and indeed at selected milestones along, the medical education process, but such a document would be immensely valuable. It would logically identify key themes or emphases—such as patient-centeredness, patient safety applications, teamwork, communication skills, and professionalism—that should be emphasized throughout the curriculum and the medical student experience. It should as well set forth expected clinical competencies that complement those framed by the IOM, ACGME, and ABMS and underscore the need to weigh the development of important skills and behaviors at at least the same level of importance as the acquisition of medical knowledge. We would then begin to graduate classes of physicians who are consistently prepared in their abilities not only as clinicians but also as mentors and teachers of patient safety.

From there, the baton passes to the residency training programs and their overseer, the ACGME whose accreditation process is framed around its core competencies, and then finally to the ABMS and its various certification boards and to the purveyors of continuing medical education

(CME)—medical school and teaching hospitals—who operate in this regard under the aegis of the Accreditation Council for Continuing Medical Education (ACCME). The development of patient safety knowledge and skills should be made available as discrete continuing education activities, and the principles of patient safety should be integrated into the broad range of CME courses. Eventually, these CME activities should reinforce and strengthen the knowledge and skills of practitioners who have had patient safety education and training in medical school and their residencies. And in the near term, CME could become a core mechanism for furthering the education of the thousands of current practitioners who never had the opportunity to develop patient safety competencies as part of their medical school education and residency training.

Recommendation 7. Medical schools, teaching hospitals, and residency training programs should ensure a coherent, continuing, and flexible educational experience that spans the four years of undergraduate medical education, residency and fellowship training, and life-long continuing education.

- a. Patient safety curricular content and experiences should be longitudinal to the extent possible and be linked to desired competencies that support the provision of safe, patient-centered care.**
- b. The concept of patient-centered care should be introduced in the first year of medical school and be reinforced throughout the educational continuum.**
- c. Medical schools should assure that graduating medical students are properly grounded in patient safety concepts and their applications in preparation for entry into residency training.**
- d. Residency training program patient safety education and training efforts**

should build on medical school education and training preparation to provide a truly graduate patient safety training experience.

- e. Continuing medical education efforts supported by the medical school and/or the teaching hospital should provide ongoing enhancement of learners' patient safety knowledge and skills that promote and enable contemporary patient safety practices.**

* * *

Responsibilities for moving the foregoing Recommendations forward lie primarily with medical schools and teaching hospitals and their leaders. In medical schools, leaders include the dean and his/her senior staff, department chairs, and other faculty leaders. In teaching hospitals, those leaders include the CEO and his/her senior staff, the ACGME Designated Institutional Officer (DIO), department chairs, and residency program directors.

Defining and measuring success with respect to these Recommendations will be challenging, as is often true for patient safety interventions. To

begin with, the impacts of the progressive implementation of these Recommendations will likely not be felt—let alone be measurable—for at least a decade. In addition, the success or failure of public policymakers in addressing such key issues as payment reform and medical liability reform will also have a great deal to do with the ultimate achievement of tangible and measurable improvements in patient safety. That said, there is more than sufficient evidence that effective implementation of each of the foregoing Recommendations will have intrinsic value in itself, and such implementation efforts can certainly be measured. Further, if the LCME does establish specific terminal competencies for graduating medical students, student success in demonstrating these competencies will be measurable as well. Indeed, the ACGME is already far along in developing measurement strategies for assessing resident achievement of the ACGME/ABMS competencies.



Part III. Strategies for Change

Accreditor Opportunities

There is today apparent growing interest among medical school faculty and students in understanding and teaching patient safety. Many of the current efforts involve limited courses, but some schools are pursuing much more aggressive and elaborate patient safety education and training initiatives. However, the progress is uneven at best and still non-existent in some schools, even though the urgency to train physicians to become patient safety problem-solvers and leaders is great. Strategies need to be formulated to leverage acceleration of the desired changes set forth in this paper. Among the potential strategies, modernization of the LCME and ACGME standards appears to offer the greatest opportunity to create substantive positive change.

The accreditation status of medical school “programs” that provide education and training leading to the M.D. degree is determined by the LCME, which is the only entity recognized by the U.S. Department of Education to assume this responsibility.^{84, 85} The LCME is jointly sponsored by the AAMC and the Council on Medical Education of the American Medical Association. LCME accreditation is required for medical schools to receive federal grants for medical education and to participate in federal loan programs. Most state licensure boards require that medical schools be LCME-accredited as a

condition for licensure of their graduates. Finally, school accreditation by the LCME is required to permit the school’s students to take the United States Medical Licensing Exam (USMLE) and to matriculate into residency training programs accredited by the ACGME. The accreditation process requires medical schools to provide assurances that their graduates exhibit *general* (emphasis added) professional competencies that are appropriate for entry to the next stage of their training, and that serve as the foundation for life-long learning and proficient medical care.

One of the more significant changes in the LCME standards in recent years has been the creation of a new standard on the learning environment (MS-31-A).⁸⁵ However, the new standard does not mention organization culture and the important characteristics that positive cultures need to bring to the support of constructive learning environments (see Recommendation 1). Nor is there explicit mention of the vital importance of leadership in creating these facilitative cultures and learning environments. In this regard, it is notable that The Joint Commission has recently issued a new standard that holds health care organization leaders accountable for creating and maintaining a culture of safety, and explicitly charges them to “address disruptive behavior of individuals working at all levels of the organization, including management, clinical and administrative staff, independent practitioners, and governing body

“The fundamental importance of patient safety in medical care is at least as great as the importance accorded to other specific content areas that have been singled out in the LCME standards as explicit curriculum requirements.”

members.”⁸⁶ The responsibilities of deans and department chairs, and other faculty leaders in assuming a similar leadership role should be made explicit in the LCME standards.

Second, the previously articulated need to introduce patient safety teaching early in the medical education curriculum and to extend its applications throughout the curriculum frames a strong case that the LCME standards should make patient safety education an explicit curriculum requirement. This recommendation is tendered in full recognition of the significant number of scholarly priorities that compete for attention in medical school curricula. Nevertheless, the fundamental importance of patient safety in medical care is at least as great as the importance accorded to other specific content areas that have been singled out in the LCME standards as explicit curriculum requirements. These include behavioral and socioeconomic subjects (at standard ED-10), culturally competent care (at standards IS-16 and ED-21), clinical and translational research (at standard ED-17-A), common societal problems (at standard ED-20), medical ethics and human values (at standard ED-23), and eight basic sciences by individual name (at standard ED-11).⁸⁵

Finally, as previously stated, the time is now opportune for the LCME to set forth expected terminal competencies for graduating medical students. At present, the LCME standards simply require the medical schools to develop school-specific objectives which guide the development of “competencies that the profession and the public expect of a physician” (at standard ED-1-A).⁸⁵ By contrast, the ACGME/ABMS competencies (see Part I), developed in 1999, today provide the basic underpinning of the ACGME accreditation process.^{24, 25} This would seem to be a desirable evolution for the LCME accreditation process as well. Indeed, the previously referenced (in Part II) AAMC/HHMI report issued in the spring of 2009 notes that, “The shift from defining required

courses to articulating competencies is becoming increasingly widespread in education,” and goes on to describe in detail separate series of recommended competencies both for medical school graduates and for entering students.⁸³ This is not to suggest that these specific competencies should necessarily be adopted *in toto* by the LCME. However, they constitute a logical starting point for an important process that might logically also draw upon or link to the ACGME/ABMS competencies and address the basic patient safety skills and behaviors described in this paper as well.

The ACGME is the principal evaluator and accreditor of medical residency programs in the U.S.⁸⁷ Established in 1981, the ACGME includes among its member organizations the American Board of Medical Specialties, the American Hospital Association, the American Medical Association, the Association of American Medical Colleges, and the Council of Medical Specialty Societies. The standards framework that it has established includes detailed sets of Institutional Requirements and Common Program Requirements.⁸⁸ In addition, the ACGME has 26 Residency Review Committees that may set additional expectations for each of 26 specialty training programs.⁸⁷

The ACGME could also have a profound effect on both student education and resident training through expansion of its Institutional Requirements and its Common Program Requirements and through its Institutional Review and Residency Review Committees. Specifically, ACGME standards should set forth expectations for the creation of cultures of safety and learning similar to those suggested for the LCME above. Again, because development and maintenance of these cultures are leadership-driven, the accountabilitys of teaching hospital CEOs, ACGME Designated Institutional Officers, and residency program directors in this regard need to be explicitly stated. In addition, the ACGME standards

could and should develop behavioral and patient safety competency requirements for attending physicians who serve as faculty and mentors for both residents and students.

Recommendation 8. The LCME should modify its accreditation standards to articulate expectations for the creation of learning cultures having the characteristics described in Recommendation 1 above; to establish patient safety education—having the characteristics described herein—as a curricular requirement; and to define specific terminal competencies for graduating medical students.

- a. The cultural expectations might best be addressed at standard MS-31-A.
- b. The establishment of patient safety instruction as a curricular requirement could be addressed either in the Institutional Setting standards chapter or in the Educational Program standards chapter, perhaps best at standard ED-7.
- c. The definition of medical student terminal competencies might best be addressed at standard ED-1-A.

Recommendation 9. The ACGME should expand its Common Program Requirements to articulate expectations for the creation of learning cultures having the characteristics described in Recommendation 1; to emphasize the importance of patient safety-related behavioral traits in residency program faculty; and to set forth expected basic faculty patient safety competencies.

- a. A fundamental expectation for all residency program faculty should be that they display competency in interpersonal skills, leadership, teamwork, and collaboration.
- b. Residency programs should define program faculty patient safety competencies as including the ability to demonstrate basic knowledge about

error causation and mitigation, human factors concepts, safety improvement science, systems theory and analysis, systems design and re-design, teaming, and error disclosure and apology.

- c. The adequacy of residency program learning cultures and faculty safety-related competencies should be addressed in the annual program and faculty evaluations.

Recommendation 10. The LCME and the ACGME should direct particular attention to the adequacy of the patient safety-related preparation of graduating medical students for entry into residency training.

Monitoring and Public Reporting on Medical School Performance

A number of medical schools are beginning to move forward on many of the necessary changes in medical education that are discussed in this paper (see Table 2). One would hope that others will follow. But hope is far from sufficient when the stakes are this high. Some ongoing credible mechanism is needed to monitor school progress toward, and, later, maintenance of achievement of, the objectives set forth herein.

The LCME generally conducts its accreditation reviews of individual medical schools every 8 years.⁸⁴ These searching evaluations include the gathering of student views on the environment and the quality and effectiveness of the educational experience, but this information is simply integrated into the evaluation process and not otherwise disseminated or made public. The AAMC conducts a survey of graduating medical students each year, and results are provided to the individual medical schools, but again, school-specific results are not publicized.⁴⁸

The Roundtable believes that focused evaluations of medical schools should be undertaken on an annual basis and that the school-specific results

TABLE 2. Medical Schools That Have Begun to Implement Changes Recommended in This Report

Case Western Reserve University School of Medicine	University of Chicago Pritzker School of Medicine
Dartmouth Medical School	University of Connecticut School of Medicine
Duke University School of Medicine	University of Illinois College of Medicine at Chicago
Mayo School of Graduate Medical Education	University of Kentucky College of Medicine
Michigan State College of Human Medicine	University of Michigan Medical School
Northwestern University Feinberg School of Medicine	University of Minnesota Medical School
Ohio State College of Medicine	University of Missouri School of Medicine
Southern Illinois University School of Medicine	University of Nebraska College of Medicine
Tufts University School of Medicine	University of North Carolina School of Medicine
University of California San Francisco School of Medicine	University of South Florida College of Medicine
University of Central Florida College of Medicine	University of Virginia School of Medicine
	Vanderbilt University School of Medicine

should be made public. These evaluations would assess medical school education and training priorities, school effectiveness in shaping desired student behaviors and competencies, and the creation of school and teaching hospital cultures that support patient safety.

The evaluation dimensions would include quantitative and qualitative measures of formal education on patient safety and health care quality in the classroom and in simulated experiences that facilitate application of related knowledge and skills; clarity and enforcement of behavioral norms that foster treatment of students with dignity and respect; strength of faculty development programs; safety culture of the teaching environments; whether students are permitted and encouraged to report errors and harms that they observe; harmonization of all four years of medical school around a patient safety education platform; fulfillment of inter-professional education opportunities; and “psychological safety” (i.e., whether the student can safely speak up and/or question authority).

Performance would be evaluated against standardized metrics, and publication of the evaluation results would be done in a fashion consistent with the transparency and accountability objectives reflected above.

Recommendation 11. A survey of medical schools should be developed to evaluate school educational priorities for patient safety, the creation of school and teaching hospital cultures that support patient safety, and school effectiveness in shaping desired skills, attitudes, and behaviors.

a. The evaluation should include:

- **Quantitative and qualitative measures of formal education on patient safety in the classroom and in simulated experiences that facilitate application of related knowledge and skills.**
- **Clarity and enforcement of behavioral norms that foster treatment of students with dignity and respect.**
- **Strength of faculty development programs.**

- **Safety culture of teaching environment.**
 - **Whether students are permitted and encouraged to report errors and harms that they observe.**
 - **Harmonization of all four years of medical school around a patient safety educational platform.**
 - **Fulfillment of inter-professional education opportunities.**
 - **“Psychological safety,” i.e., whether the student can safely speak up and/or question authority.**
- b. Specific metrics need to be developed for each of these evaluation dimensions.**
- c. The survey should be administered annually, and its results should be publicly reported.**

Textbooks and Testing

One of the reasons for the low to non-existent profile of patient safety in medical schools is its low to non-existent profile in medical textbooks utilized by medical students. The same may be said for the various written and other examinations to which medical students are subjected. The content of these education and evaluation vehicles makes potent statements as to what is considered “important” in medicine.

Student facility in utilizing the internet and other media to supplement their learning can help to bridge the patient safety visibility gap. Indeed, the extraordinary uptake of the IHI Open School curricular offerings in a relatively brief period of time dramatizes what is possible.⁷³ Meanwhile, efforts need to be undertaken to connect other major purveyors of safety knowledge and skills—the Agency for Healthcare Research and Quality, The Joint Commission, the National Quality Forum, the National Patient Safety Foundation, and the Veterans Administration National Center for Patient Safety—with medical students. That is the

responsibility both of these organizations and the medical schools. There is also a compelling need for a single source textbook that addresses patient safety and quality improvement content and competencies. Most of all, patient safety content needs to be integrated into other widely used medical textbooks.

Examination content is an even more powerful vehicle for capturing the intellectual attention of both medical schools and their students. To this end, the National Board of Medical Examiners (NBME), which together with the Federation of State Medical Boards prepares the United States Medical Licensure Examination (USMLE), is currently investing in the development of competency-based examinations that presumably will provide effective ways to assess analytic and other skills.⁸⁹ This could and should be a major opportunity for putting testing for patient safety knowledge and skills on the map. Similarly, the American Board of Medical Specialties, the parent body of the certification boards for the major medical specialties, is developing a patient safety module.⁹⁰ The content of this module should eventually find expression in the various board certification examinations.

Meanwhile, on the front end of the testing process, the Medical College Admission Test (MCAT) is currently undergoing development of what will become its fifth iteration.⁹¹ That version, expected to be introduced no earlier than 2013, “will consider recent calls for new information about applicants’ mastery of natural sciences and humanities content; behavioral and social sciences and humanities content; and professional competencies like cultural competence, communication skills, and professionalism.”⁹² This too appears to be an opportunity to accentuate the importance of foundational patient safety concepts such as systems theory and applications, human factors concepts, and error causation for those who are seeking entrance to medical school.

“Since preventable adverse events rank at least eighth among causes of death in the United States, a strong case can be made that patient safety is a major public health issue and that patient safety education and training should be made a high priority for funding.”

Financial Incentives

Titles VII and VIII of the Public Health Service Act authorize the annual awarding of programmatic grants to support health professional education.⁹³ Title VIII focuses predominantly on nursing professionals, while Title VII funds are available to medical, dental, and other professional schools. The general purposes of these Titles are to increase the numbers of health care professionals, improve the distribution of these professionals to underserved areas, and provide education and training opportunities for more minority professionals. That said, however, there have been multiple instances over the past forty years where funding under these Titles was provided to assist schools in improving or enhancing their curricula.⁹⁴ Since preventable adverse events rank at least eighth (and probably higher) among causes of death in the United States, a strong case can be made that patient safety is a major public health issue and that patient safety education and training should be made a high priority for funding under both Titles VII and VIII. Since Title VII and Title VIII funding has now dwindled to a few hundred million dollars a year, a compelling case can also be made for new stimulus money under these Titles to address this critically important public health priority. The recommendations set forth in this paper would provide a ready-made framework for evaluating the impacts of such programmatic funding.

At the state level, largely discretionary funding of varying levels is provided to a substantial number of medical schools. Many of these states have existing and/or new high-priority patient safety

initiatives (e.g., the mandatory reporting of “never events”). Current state funding levels create significant opportunities for interested states to further their safety-related public health priorities through leveraging implementation of the medical education reforms recommended in this paper.

The same proposition applies to the Medicare Indirect Medical Education (IME) funds that are used to support graduate medical education.⁹⁵ Here, the funding is in excess of \$5 billion per year. Medicare policy tensions do exist over the question as to whether the IME funds are actually supporting patient care or medical education activities. These exist because the payment of Medicare funds is theoretically supposed to be limited to support for patient care. However, it is perhaps time to declare that this money is indeed supporting medical education and then describe the important opportunity this presents for leveraging changes in undergraduate and graduate medical education that will improve patient safety.

Recommendation 12. Financial, academic, and other incentives should be utilized to leverage desired changes in medical schools and teaching hospitals that will improve medical education and make it more relevant to the real world of patient care.

a. The federal government should commit existing and new Title VII funds to support patient safety education and training in medical schools, and should use the recommendations set forth in this paper as the framework for evaluating the success of this programmatic initiative.

- b. States that provide significant funding to medical schools within their borders should consider making such funding contingent upon demonstrated satisfactory performance against the recommendations of this paper that are the responsibility of medical schools.**
- c. Continued access to federal funds to support residency training programs should similarly be tied to demonstrated satisfactory performance against the recommendations of this paper that are the responsibility of teaching hospitals.**
- d. Efforts should be launched to develop a textbook that focuses primarily on patient safety content and competencies, and to integrate relevant patient safety content into other standard medical textbooks.**
- e. Relevant patient safety-related content should be included in the fifth iteration of the MCAT which is currently under development.**

- f. Standardized post-admission external tests (e.g., those developed by the NBME) should emphasize knowledge and analytic skills relevant to patient safety in order to re-direct the intellectual attention of both medical schools and students to this important knowledge and skills.**

* * *

Responsibilities for Recommendations 8 and 9 belong to the LCME and ACGME, respectively, and for Recommendation 10, to the LCME and ACGME together. For Recommendations 11 and 12, responsibilities for pursuing implementation will lie principally with the Lucian Leape Institute itself.



CONCLUSION

Twenty-four centuries is a long time for a significant problem to finally come to a head, but medical care has come a long way since Hippocrates implored physicians to “do no harm.” The remarkable advances since then, especially those of the past century, have saved countless lives and enhanced the quality of life for millions of people who otherwise would have died or suffered the prolonged effects of disease and injury. Ironically, however, these advances have also given cover to a problem that continues to pervade medical care: the thousands of preventable adverse events that kill and maim patients every day.

But changes are occurring that give us new hope. We have now just come to the tenth anniversary of the release of the IOM report *To Err Is Human*.⁶ That report was remarkable not only for shredding the secrecy that had long enshrouded the patient safety problem but also for its boldness in framing the problem and suggesting logical, if challenging, solutions. While some observers and analysts have expressed disappointment about the apparent lack of progress over the past decade in addressing what was and still is a “top ten” cause of death in the U.S., the level of awareness of this issue among the public, health professionals, and provider organizations is now stunning, and the hunger for solutions—indeed for being part of the solution—is growing rapidly. The question has, with seeming suddenness, become not whether to invest in patient safety improvement but rather what changes need to be made and what strategies need to be pursued to make them happen. Today, we are seeing this awareness and, in fact, a new commitment to change among policymakers, health professionals, health care executives, and health professional schools, among others.

What is most striking, though, are the changes occurring in medical education. Five years ago, a Joint Commission initiative to promote the introduction of patient safety education and training into the curricula of medical, nursing, pharmacy, and health care administration schools failed to gain any traction within any of these disciplines. Today, at least some aspects of patient safety are being taught in over half of the nation’s medical schools, and perhaps as many as 20% of medical schools are in the process of adopting and pursuing many of the recommendations set forth in Part II of this paper. That is indeed good news. However, the bad news is that most medical schools are lagging well behind where they should be in embracing patient safety education and training. The challenges inherent in this effort are admittedly daunting, but the stakes are high and the urgency is great.

This white paper seeks to underscore this urgency, and makes explicit recommendations for leaders in medical education and teaching hospitals who must become part of this solution. Even under the best of circumstances, it will take years to create a critical mass of patient safety-competent physicians. But each physician who fully grasps the multiple dimensions of patient safety is one more physician likely to find humility in the challenge and therefore likely to provide safe care to his or her patients. Even more important, each such physician will have the potential to be a much-needed leader who, in collaboration with others, can help develop positive organization cultures and patient safety solutions. When this happens across the profession, we will be able to lay to rest the concerns of Hippocrates and other leaders over the centuries who have recognized that the first obligation to patients is not to harm them.

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The Lucian Leape Institute at the National Patient Safety Foundation offers sincere thanks to the many organizations that have generously supported the work of the Institute since its inception in 2007 and recognizes in particular the significant support provided by the following partners:

Hospira

McKesson

The Doctors Company Foundation

