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Virtual Mentor

FROM THE EDITOR
Breaking Tradition: Changing Medical Education to Preserve the Patient-Doctor Relationship

In 2003, the Accreditation Council for Graduate Medical Education (ACGME) mandated that residents could work no more than 24 consecutive hours and limited resident hours to an average of 80 per week over the course of 1 month. The creation of this policy was prompted by the 1984 death of Libby Zion, an 18-year-old who was admitted to New York Hospital for a high fever and died while under the care of overworked and fatigued interns. The incident led to a critical reevaluation of resident work hours. The possible harm patients could experience under the traditional training system was serious enough to provide the impetus for a large-scale reform of residency education.

In developing the theme for this issue of *Virtual Mentor,* "Humanizing Physician Learning," I kept referring to the Libby Zion case. How and why did it take so long for the profession to realize that the traditional training system put patients at risk of harm and even death? During White Coat Ceremonies around the country each year, future physicians take the Hippocratic Oath and make a promise to "do no harm" and keep patients central in all aspects of care. But, are the ways that we are educating and training our future doctors—using standards that often have remained unchanged for years—preventing them from providing patient-centered care?

The static nature of medical education is at odds with a world that is rapidly changing. Advancements in medical technology, ever-changing financial incentives, growing and increasingly diverse patient populations, and potential health care reform have implications for how we will administer care to patients in the future. A number of the authors contributing to this issue have drawn from their experiences as medical educators, medical students, and policymakers to reflect on the current state of patient care. They have critically reevaluated long-standing methods of medical education and suggested ways that the medical profession can adapt to the future, while preserving and enhancing the patient-doctor relationship.

The three clinical cases that open this issue illustrate dilemmas that students, residents, and medical educators may face when attempting to break traditional practices and create new modes of training, evaluation, and admissions. The first clinical case examines the impact of work-hour limitations on surgical education and centers on a surgery intern's hesitancy to report her program for violation of the ACGME regulations because it would risk both her program's accreditation and her professional progress. Mary E. Klingensmith and Katrina S. Firlik suggest steps that residents and program directors can take to manage this dilemma. The clinical pearl,

by Holger Link and Robert Sack uses this case as the basis for a discussion of shift-work disorders.

Three perspectives are provided for the second clinical case, in which students at a hypothetical medical school debate the transition from a traditional letter-grading system to one that is pass/fail. Arguments in favor of pass/fail grading were born of a desire to reduce competition, which can negatively impact group learning. As students in the case argue, however, does pass/fail grading put students at a disadvantage when it comes to personal performance, achievement, and residency admissions? In the first commentary, Bonnie M. Miller draws from her experience helping with Vanderbilt's transition to a pass/fail grading system in 2003. Adina Kalet contends that *how* we are grading students is less important than *what* we are assessing with the grades. She argues that medical educators should focus on developing criterion-based measures that more appropriately assess whether students have acquired critical competencies necessary to become good physicians. Finally, three medical students, Ryan C. VanWoerkom, Nicholas Zorko, and Julia Halsey argue that pass/fail grading may reduce student acquisition of knowledge, with the potential to negatively impact patient care.

One-quarter of the U.S. population are members of ethic minority groups. As patient diversity continues to increase, do medical school admissions committees have a duty to increase the representation of underrepresented minorities in their ranks? The third clinical case sets up a scenario in which two members of a medical school admissions committee debate whether an applicant's ethnicity should be considered in the admissions process. The commentary, provided by Will Ross, discusses the benefits of diversifying the medical workforce to better care for a multicultural patient population. Charles Vega offers another perspective on this question in the medical education section with his description of PRIME-LC, a program aimed at reducing health disparities among Latinos. PRIME-LC graduates physicians who are dedicated to activism and health advocacy for the Latino community but does not use affirmative action in its admissions process.

In another medical education piece, Raymond De Vries and Jeffrey Gross force a rethinking of the current premedical experience and the standards presently used in medical school admissions. Ann N. Poncelet, Karen E. Hauer, and Bridget O'Brien closely examine the benefits of longitudinal integrated clerkships over the customary block rotations that comprise the clinical third and fourth years of medical school.

While the development of medical technologies has made us more sensitive to many disease processes, have these diagnostic tools further separated patient from doctor, to the detriment of both? In the medical narrative section, John Kugler and Abraham Verghese discuss the decline of clinical skills and bedside medicine due to an overreliance on technology. In the health law article, Kristin E. Schleiter highlights resident liability in medical malpractice cases. Because residency represents an intermediate stage in the transition from student to physician, when, and under what

circumstances, should a resident be held liable as a physician as opposed to a student or intern?

In the first policy forum piece, Paul Rockey and Daniel Winship argue that the goal of medical education should be to develop physicians who not only serve patients but also serve as leaders of the health care system. Richard A. Ortoski and Richard M. Raymond follow by describing the Primary Care Scholars Pathways, a 3-year medical school curriculum at their institution that is tailored to students interested in primary care and family medicine.

In the first op-ed piece, Leana S. Wen reflects on whether an MD degree is enough to provide for effective doctoring. For the second op-ed, Douglas Brown enumerates various approaches that he has used to help students and medical educators respond to ethical dilemmas during the clinical years. In medicine and society, Jordan J. Cohen, president emeritus of the Association of American Medical Colleges, delineates the ways in which medical educators can contribute to health care reform.

A year ago this month, our nation concluded an election season in which the theme of change was brought to the national forefront. We are indeed living in a world that is experiencing many changes, and the impact of transformative forces on patient care must be acknowledged by the medical profession. My hope as the editor of this issue is that the articles herein prompt discussions and critical reexamination of the traditional methods currently being used to teach and train our future doctors. If we can remember to keep patient care at the forefront during each stage of medical education, we will be able to adhere to those words that we each spoke on the first day of our medical journey, "Do no harm."

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Virtual Mentor

CLINICAL CASE
The Ethical Dilemma of Duty-Hour Reporting
Commentary by Mary E. Klingensmith, MD, and Katrina S. Firlik, MD

Mary, less than halfway through her intern year in surgery, was already feeling burned-out. She thought back to her orientation just a few months ago, when she and her fellow interns received many assurances from the program directors that the department would strictly adhere to the 80-hour work-week limitations. Those pledges, however, were followed by a speech from Dr. Thompson, the chair of the department and a world-renowned surgeon, who emphasized the importance of devotion to patient care and the field of surgery. One phrase in particular stood out during his speech to the incoming interns: "Great surgeons are those who see the extra patient, scrub in on the extra case, and stay the extra hour."

Darren, a particularly aggressive member of the intern class, had taken to working well beyond his 80 hours each week while underreporting his hours. His violation of the rules was obvious to his peers, but instead of receiving a reprimand from the program he was met with praise; Dr. Thompson singled him out as the hardest worker in his class and allowed him to scrub in on especially complex cases. The remaining interns found themselves forced to work nearly 100 hours on some weeks in order to avoid appearing less dedicated than Darren. Mary had resorted to underreporting her hours along with her fellow interns, and, while she felt bad about this, she knew that reporting the violation could cause her program to lose accreditation, which was a highly unfavorable outcome.

Commentary 1
by Mary E. Klingensmith, MD

In July 2003, the ACGME instituted duty-hour reform, limiting resident hours to fewer than 80 per week. This reform, which was radical and disruptive for a great number of residency training programs, came after several years of increasing concern that fatigued residents placed their patients and themselves at risk and that sleep-deprived learners were less able to master the cognitive aspects of training than those who were better rested. The vast majority of us in graduate medical education agreed heartily with the concepts if not the actual details; most of us who trained in the era of unrestricted work hours had personal stories to share about the errors we made, the patients we harmed (or nearly missed harming), and the personal tolls that unlimited working hours took on our lives and emotional well-being.

Much has been written about the impact of duty-hour reform, ranging from influence on resident well-being (improved) to impact on patient safety (mixed at best).

Regardless, it's clear that restricted working hours for medical trainees is here to stay. This notion received additional support from the Institute of Medicine (IOM) in December 2008, in its report, "Resident Duty Hours: Enhancing Sleep, Supervision, and Safety," which argued in favor of continued and modified work-hour limitations and increased supervision for trainees. One might quibble over the details (16 hours of continuous work versus 30 hours with an imposed 5-hour nap?), but it's clear we will never revert to unlimited working hours again.

The dilemma is that the vast majority of us who supervise and teach in residency training programs trained in "the old system" where our hours were limited only by the amount of work to be done, the only thing wrong with every other night call was that you missed half the cases, and using grand rounds and other didactic lectures as nap time was, while not ideal, widely practiced. We like to think that we are well-trained and competent physicians and that the system that created us was "good enough for us" and surely is good enough for the current generation. This flawed logic is pervasive in human nature. But it's not a helpful tenet in the current consideration of resident training. We need to hold onto the "good" about the old system (handoffs were few, opportunities to learn from patients through the entirety of their illness were many, continuity of care was taken for granted) and dispense with the "bad" (we were really tired and a potential liability to our patients).

As a residency program director in general surgery who has been in this role for 8 years (and thus lived through the transition to the 80-hour work week), I can say that the scenario created for reflection is very realistic. I oversee a residency training program at a large urban academic medical center with busy trauma, transplant, vascular, and general surgery services. I am blessed to have incredibly hard-working residents who are bright and aspire to successful careers in academic surgery. They have gotten where they are by a combination of very hard work and intelligence, and they recognize as they become more senior that connections and mentors are important aids to future success. They don't want to risk offending a potential mentor by scrubbing out of a case because they are approaching the end of a scheduled shift or being unavailable on their weekends off for discussion of cases for the upcoming week. But as program director, I tell them they must scrub out and turn their pagers off (or at least screen out work pages) on scheduled weekends off. They are caught in the middle and face ethical dilemmas as a result. Do they offend me, the program director who wants them to comply with the schedules I design (and thus aid in retaining ACGME accreditation) or Dr. Attending, who is a nationally recognized leader in the specialty they hope to join?

The system for reporting duty hours itself entangles residents in conflict of interest. If they honestly report exceeding duty hours, they risk the accreditation of their training program. And what resident wants to be in a program that loses accreditation?

What's the solution? I see two. First and foremost, those who trained before the 80-hour work week need to "get over it" and acknowledge that duty-hour reform is a

good thing. We need to stay engaged in the debate and help to fine-tune the details, but we should not argue against the more humane working hours of our trainees. We need to find some middle ground on issues of continuity of care and shift length, scheduled days off, and learning opportunities. I have faith that those details can and will be worked out both on a local level and nationally. Attending physicians and surgeons must be mindful of the access we demand of residents, plan work flow around resident availability, and not get bent out of shape when trainees cannot comply with what we want because of scheduled shifts that follow duty-hour rules. Further, we should not imply (or worse, overtly display) that he or she who stays late is stronger, better, more worthy, or more deserving of a "prize case."

I was gratified during a recent visit to another large academic department of surgery to learn that it, too, is taking duty hours seriously and actively counseling residents who are working excessive hours but not reporting them to find more balance in their lives, leave the hospital according to the schedule, and devote time to the other aspects of their lives. Increasingly, balance is being acknowledged as difficult to achieve but imperative for a lifetime of professional fulfillment.

Secondly, we should remove the moral dilemma of accurate hour reporting from residents' shoulders. I approach this by designing work schedules and manpower availability in full compliance with duty-hour regulations, and I closely monitor the system to see where we need to make adjustments. I beg my residents to be truthful in reporting their hours, focusing my concerns on the system I have created and not on them as individuals who might have violated duty-hour rules. I ask the resident who reports a 31-hour shift, "What in the system failed you?" Not, "Why did you fail my system?"

So what approaches should residents take to address these concerns if their attending physicians and program director place them in the middle? First, the intern class, including the "aggressive" peer in this scenario, should work constructively toward consensus on how the class, as a group, can help each other so everyone looks good, all the work gets done, and each has access to the good cases. Secondly, junior residents should enlist the aid of more senior residents in reporting concerns. A group of residents should approach the program director together to express concern and propose solutions to the problems of compliance. Could housestaff be better deployed across services? Should call schedules be rearranged?

Residents themselves usually have terrific answers to these problems and should be empowered to help improve their programs. If this approach to the program director is not met with success, residents should next consider taking their concerns either to other faculty in the department (division chief, chair) or another well-connected physician who will be sympathetic to the cause. Again, entering such a meeting with proposed solutions goes a long way toward gaining a successful outcome. If that seems to fail, the resident group can approach the designated institutional official (DIO) of their medical center. This person oversees all graduate medical education for residencies at the institution and can be extremely helpful in applying pressure to

departmental leadership to be certain ACGME standards are observed. The DIO wants to avoid having a training program under his or her supervision in violation because this places the entire institution in a bad light and can compromise the accreditation status of all affiliated programs at that institution.

In general, I would discourage residents from going directly to the ACGME with complaints until the preceding four attempts have been made and failed. Further, if a sizable group of residents undertakes these meetings with a unified voice, with realistic and meaningful suggestions for improvement, and in a constructive and positive manner (rather than an accusatory and emotional one), success is virtually guaranteed.

In summary, resident duty-hour reform is a good thing, will be permanent, and must be accepted and acknowledged by everyone involved in graduate medical education. To place our trainees in a situation where they are rewarded for violating these regulations is immoral, unethical, and a detriment to our profession.

Mary E. Klingensmith, MD, is a professor of surgery and program director in surgery at Washington University in St. Louis.

Commentary 2
by Katrina S. Firlik, MD

As a neurosurgery resident, I became accustomed to the mantra: "Eat when you can; sleep when you can; and don't mess with the brainstem." The more casually one could toss off the brainstem bit, the more compelling, as if one were lumping it together with grabbing a KitKat from a vending machine or taking a catnap in the back row of M&M conference. We took the "sleep when you can" quite literally and almost as seriously as "avoiding the brainstem." Patients would have been horrified to find out where and when we caught our desperately needed snatches of sleep during our 100-plus-hour work weeks.

One of our attending physicians was notorious for having us scrub in on the lengthiest and most tedious of craniotomies, but allowing us no role other than observer for large stretches of time while he toiled under the microscope. Many of us learned how to position our sterile selves just so on an OR stool, arms crossed, head tipped back against the wall, angled so that the scrub nurse could not see that we were asleep for minutes at a time rather than observing the micro movements of the instrument tips on the television monitor. We would marvel at one another's ability to sleep during these cases as we peeked in on each other from the hallway, stifling our laughter.

The neurosurgery program I trained in was the largest in the country at the time. At one point, our chairman started a new policy: the on-call resident would call him at 9 p.m. with a brief update. He wanted to keep closer tabs on our behemoth service. I remember a several-month period when we had a particularly large number of

patients, during which I would have to break free from routine evening rounds in order to call the chairman. Our entire team was still rounding at 9 p.m., generating new to-do items that would land us home at 11 p.m. ("Sorry to wake you up, Mrs. Jones. It's 10 p.m. and time for your lumbar puncture.") Some of us had been in the hospital since 5:30 a.m. (not to mention the resident who had been on call the previous night).

In retrospect, a quick nap in the operating room—during a case—is horrifying, and team rounds at 9 p.m. is simply ridiculous. Given my experiences as a resident prior to the work-week restrictions, I am strongly in favor of residents' getting a healthy amount of sleep, even if forced through regulation and looked upon with contempt by certain members of the old guard. I have to admit, though, that "Eat when you can; sleep during your regulated hours off; and don't mess with the brainstem" delivers less of a punch than the original version.

But how can an 80-hour work week be enforced in surgery training? As Mary the intern has discovered, the traditional culture of surgery, with its extreme dedication, bravado, and competition, will not be stuffed easily into the tight mold and the new culture of regulation.

With the passing of the old guard, for better or for worse, enforcement will come more naturally. When the Dr. Thompsons of the attending world are no longer in charge, the Darrens of the intern world will be less motivated to violate the rules. But what can be done during this awkward period of culture clash, with the slow changing of the guard?

I sympathize with Mary, and I do have a suggestion for her. Use the military-like hierarchy of residency to your advantage. Interns don't have much clout. Appeal to the most well-respected and sympathetic senior or chief resident, and have him or her convey the strong concern regarding violations to the program director, as well as to Dr. Thompson himself. This indirect route, which may seem passive or even cowardly at first, accomplishes two important goals. It prevents Mary and her like-minded interns from having to worry about "appearing weak" in front of their attendings (sadly, a potential career threat) or having to play the direct whistle-blower role so early in their long training. It also allows her and her colleagues to preserve at least cordial relations with Darren, which is important while looking ahead to several years in the trenches together.

Interestingly, I have also found that appealing to a well-respected nurse or other allied professional can have a powerful influence on certain senior surgeons. Some surgeons have spent 1 or 2 decades working with the same ICU or OR nurses and maintain close professional bonds with them. These nurses are more likely to witness the questionable behavior or judgment of an intern who has been working those extra hours, sleep deprived. If such a nurse can act as an ally in Mary's desire to monitor work-hour violations, chances for enforcement may be greater. Dr. Thompson or the program director is likely to take that nurse's concerns seriously.

Tangentially, I recall that the most tangled of ethical violations during my own training—a resident colleague's use of intravenous drugs while on call and caring for patients—was uncovered and reported by a perceptive emergency department nurse, based on a series of unusual clues. In retrospect, many of us had noted subtle signs ourselves, but failed to piece together the clues or to act on our suspicions.

Failing these indirect but potentially more powerful approaches—appealing to a more senior resident or allied health professional—Mary may need to report the violations herself, despite the social or professional risks.

Whatever the approach, I firmly believe that the work-week violations cannot simply be swept under the rug. Fear of losing accreditation does not justify inaction, and nipping the problem in the bud is the only way to go. As a simple exercise, Mary should try the classic *New York Times* test. Suppose a grave and preventable medical error were made by Darren or another sleep-deprived intern and hit the front page of the *New York Times* in an explosive expose. The resourceful *Times* reporter then uncovered longstanding and unreported violations of work-week limitations. If Mary had failed to report these violations, how would she feel about her inaction (and, of course, the medical error itself)? Your personal and professional actions—or inactions—should always be able to withstand this effective, albeit contrived, test.

And here is one final, even simpler test: pretend that you are a patient. You find yourself sitting, cold and vulnerable in your flimsy gown, in the pre-operative holding area. The resident who will be scrubbing in on your case walks in and introduces herself. With nervous laughter, forcing a smile, you say, "Hope you got enough sleep last night!" She nods, tentatively. You're not convinced.

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CLINICAL CASE
Can a Pass/Fail Grading System Adequately Reflect Student Progress?
Commentary by Bonnie M. Miller, MD, Adina Kalet, MD, MPH, Ryan C.
VanWoerkom, Nicholas Zorko, and Julia Halsey

As David, a second-year medical student, made his way into the lecture hall, he was surprised to see how packed the room was. A group of 25 third-year students, or one-fifth of the class, had recently petitioned to switch from a traditional letter-grade system to one that was pass/fail at their school, and the medical student government organized a townhall meeting for students to discuss the matter. Unable to find a place to sit, David stood against the wall alongside his good friend Beth, a fellow second-year. In the room he saw students of all levels, from first-years to fourth-years, engaged in excited chatter.

The third-year class president, Sam, stood up. "Okay everyone, quiet down so that we can begin the discussion. We had not expected a turnout of this magnitude; it's clear that this is an issue many of you feel quite passionately about. The administration has informed us that adopting a pass/fail system will require a majority vote from the student body."

The volume level in the room suddenly increased.

He continued, "So, we hope that this meeting will serve as a lively debate where students on either side of this issue can share their arguments with the voting body."

"Pass/fail is such a great idea," David whispered to Beth.

To his surprise, she disagreed. "I don't think so," Beth replied. "I personally work harder and perform better when I am graded."

One of the third-year petitioners stood up to argue, "Our medical school is known for being one of the most intensely competitive programs in the country. We are already so stressed out—becoming pass/fail would remove an atmosphere of hypercompetition, and that will be a good change for our mental, emotional, and physical well-being." His words were met with applause from some students in the hall.

Another third-year petitioner presented a counterargument. "The majority of our graduating students match with residency programs each year, and most of those match at one of the programs they ranked in their top three. We've done very well with grades—would the same be true if we became pass/fail? Also, those of us

interested in matching into very competitive specialties, such as dermatology, ophthalmology, and surgical specialties are put at a disadvantage since class rank and academic performance are highly regarded by residency directors in these specialties."

David, who himself had a particular interest in going into surgery, looked around the hall and saw a number of students nodding their heads in agreement. Beth nudged him playfully and whispered, "See what I mean?"

Commentary 1
by Bonnie M. Miller, MD

The primary purpose of any grading system is to measure student achievement of established learning objectives. Performance data let individual students know where they stand in the development of needed competencies. Aggregated performance data supply faculty and medical school administration with information about the effectiveness of teaching. A traditional grade stratifies students according to level of achievement and can motivate students, reward effort, and perhaps signify suitability for a potential area of study. A pass/fail grade indicates simply that a student has achieved an expected level of competence, information that is critically important if medical education is to fulfill its obligation to the public.

The ideal grading system would also encourage the development of desirable professional behaviors. Does a traditional grading system encourage students to constantly strive for excellence, a habit that, theoretically, they would maintain when they no longer receive grades? Does a pass/fail system encourage collegiality, collaboration, and teamwork, since no one is disadvantaged by another's success, and mutual benefit can result from sharing. In the case scenario we are commenting on, is Beth correct in fearing a lack of motivation in the absence of grades, or is David justified in his concern about grade-induced hyper-competitiveness?

I believe that concerns about both consequences are justified, but my experience with grading systems suggests that neither is inevitable. Based on our grade-system change at Vanderbilt University earlier in the decade, I believe that elements such as faculty role modeling, selection of teaching strategies, careful and inclusive selection of the qualities that are being assessed, and use of criteria-based grading systems are more important contributors to student evaluation than whether or not letter grades are used.

Faculty Role
Grading systems exist within the larger context of an educational environment that can powerfully mold the professional development of students. If students are hypercompetitive, it is unlikely that the grading system alone creates that behavior. Similarly, if students consistently aim their efforts at minimal passing performance, the environment might lack the ingredients needed to inspire excellence. Regardless of the grading system, medical school faculty and administration should be aware of

the environments they create and monitor them with vigilance to assure that they support the attitudes and behaviors expected of the profession.

In any grading system, faculty members should serve as role models who demonstrate a passion for excellence and a quest for improvement, both in their teaching efforts and their patient-care responsibilities. Role models who strive for excellence, not because of grades but for the good of those they serve, help students move beyond the external rewards that motivated them in their previous endeavors. Whether in teaching teams or in clinical teams, faculty members can also model the collaboration and collegiality that are important for effective, high-quality patient care. Finally, when faculty members care for the well-being and professional growth of their students, they model the compassionate and nurturing attitudes we hope those students will adopt.

Teaching and Course-Management Strategies
Teaching strategies can also ameliorate the potentially negative side effects of a grading system. Many students study best in groups or learn most deeply when they are challenged to teach their peers, and schools with traditional grading systems can actively promote these approaches. Faculty can use course-management systems that allow all students to see the answers to all questions asked, and students can be encouraged to post helpful articles and learning tips. Team-based learning rewards group performance as opposed to individual effort, while creating pressure not to let one's peers down, which discourages the slacking that a pass/fail system might encourage.

Choosing What to Measure
Perhaps the grading system a school uses is less important than the qualities it chooses to grade. Assessment indeed drives learning, and if we feel that the professional development of our students is critical, we should demonstrate that by assessing it. In both science-based and clinical courses, students should be evaluated on their initiative, engagement with and concern for their own learning, interpersonal skills, teamwork skills and collegiality. Schools can devise grading policies, whether pass/fail or traditional, in which failure to demonstrate one of these key attributes can lead to failure in the course, regardless of cognitive achievement.

Criteria-Based Grading
Finally, the use of a normative versus a criteria-based grading system can influence student behaviors. In the former, the grade distribution is determined by comparative student performance, limiting the number of highest grades and creating an atmosphere in which one student's performance can influence the grade of another. This is more likely to induce competition. In a criteria-based system, the requirements for each grade interval are predetermined, and any student who meets the designated requirements receives the designated grade, even if an entire class qualifies for an A. While this model could lead to grade inflation, it does recognize all students who achieve a certain level of excellence. And shouldn't all medical teachers aspire to the goal of having all students excel?

The Vanderbilt Grading Experience
In 2002, Vanderbilt University reexamined its traditional letter grading system. Like students at David and Beth's school, our students performed very well in the residency match, and we were leery of changes that would make it more difficult for program directors to evaluate students. Unlike students at David and Beth's school, ours did not complain of an overly competitive atmosphere. I'd like to think that this was because of our collegial educational environment, but a criteria-based system probably helped. Our greatest concern at that time was for the fairness of grades in the first year of medical school. Because of the wide variation in our students' undergraduate preparation and the difficulties of adjusting to medical school, we felt that letter grades reflected not only effort and ability, but also the strength of the undergraduate program, the major a student had selected, and the ease of social transition. Most of our students who received marginal grades in the first year subsequently performed at very high levels, but were left with transcripts that marred their overall records.

To balance our concern for first-year grades with our concern for the impact of a pure pass/fail system on the residency application process, we decided upon a hybrid system with pass/fail in the first year only; honors/pass/fail in the second year; and honors/high pass/pass/fail in the third and fourth years. We hoped that the noncompetitive culture of collaboration established in the first year would continue throughout the remaining 3 years, even as more grade intervals were introduced.

Some faculty feared, like Beth, that first-year students would lack the motivation to put forth their strongest efforts. Fortunately, this fear never became a significant reality. Our curriculum remains rigorous and demands hard work, and the environment still encourages our students to reach for excellence. Occasionally a student's performance slips on the last exam in a course if he or she is easily within the passing range, but this has not been a large enough effect to diminish overall class performance from year to year. Student performance in the subsequent years of medical school and on Step 1 of the United States Medical Licensing Examination (USMLE) has actually improved, relieving anxieties about the grading system's long-term negative impacts on the learning habits.

Paradoxically, in the first year of the transition, students and faculty sensed an increase in student competitiveness in the second-year class, even though this class entered with a traditionally graded system. We quickly realized that this resulted from a concurrent switch to a normative-based system that limited the number of honors grades to 25 percent of the class. In the following year, we reverted to a criteria-based system that set the honors bar extremely high to combat grade inflation but allowed all students who cleared that bar to receive an honors grade. Many students in that second-year class were also unhappy with the change and reported that they had selected Vanderbilt because of its traditional grading system. We learned from this experience that whenever possible, major policy and curriculum changes should be phased in with the entering classes. I have also become a strong

believer in a criteria-based system that sets high standards but proudly recognizes all students who meet them.

Because we maintained four grading intervals in the clinical years, we experienced no measurable change in the outcomes of our residency match. For schools that use a pass/fail only system throughout the 4-year curriculum, program directors rely more on qualitative measures, such as the comments recorded on clerkships assessment forms, letters of recommendation, and the nature of student leadership and scholarship accomplishments. With a sense that these subjective measures are less reliable than the objectivity of grades, program directors also tend to rely more heavily on Step 1 scores and the reputation of the medical school.

No grading system is perfect in its ability to assess learners accurately, promote professional behaviors, and predict future accomplishments. Regardless of the system selected, a school must be aware of the potential for unintended consequences and should strive for an educational environment that counters these and encourages students to excel for the right reason, which is that their excellence will someday improve the lives of others.

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Commentary 2
by Adina Kalet, MD, MPH

As medical educators, our responsibility to society is to ensure that all physicians are competent to practice medicine. Ideally, both faculty and students should enthusiastically engage in an evaluation system that facilitates our fulfilling this responsibility. I am a strong believer in a grading system that is ultimately pass/fail—but is at the same time rich in confidential, formative feedback that helps students identify their strengths and weaknesses. To be meaningful, the "pass" thresholds must be competency- and criterion-based, not arbitrary or norm-referenced, i.e., predetermined percentages of students pass and fail.

Competitive residency programs choose residents based on whatever evidence of their abilities exists. Residencies are looking for students who are a good fit for their program, well prepared, and capable of handling the work. The absence of letter grades on the formal transcript, without evidence of a rigorous, reliable assessment process is problematic for two reasons. First, it places enormous, undeserved pressure on students to do well on National Board Exams. Second, this approach overemphasizes the reputation of the medical school and its admissions policies.

The debate presented in the case scenario focuses on the wrong outcomes. For example, students often defend pass/fail systems as more conducive to a relaxed learning environment because there is less interpersonal competition. I am not certain that this reflects reality. All medical students are highly achievement-oriented

and many are competitive by nature. To be successful and competent physicians they must learn to manage the negative impact of these otherwise valuable personal traits in complex and competitive environments. On the other side of the argument, pass/fail systems disadvantage students who are consistently struggling because it allows them to squeak by without being identified for special attention early. In addition, even in schools like mine, NYU Medical Center, that operate with a pass/fail preclinical system, numeric grades are generated and followed for certain purposes (e.g., AOA determination), and students are well aware of this contradictory policy.

In saying that the grades debate often focuses on the wrong outcome, I also mean that scores on exams are only useful if the exams themselves are reliable and valid measures of what they are meant to measure. Ideally, competency exams would provide students with detailed information to help determine whether they had the minimum competency to serve as physicians. We would overcome current weaknesses in measuring the remarkable capacities some students have in areas such as interdisciplinary teamwork and complex critical thinking. Once we have decided on fair, criterion-based measures that assess critical competencies, there is no way we could ethically, morally, or professionally argue against using such measures. Since most of our exams or grading systems do not reach this level of evidence, however, we use them as blunt instruments rather than sources of meaningful information.

In sum, I don't care as much as many students do about whether we use pass/fail or other systems. I care that we measure what is important and act on those measures to ensure excellence in our graduates.

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Commentary 3
by Ryan C. VanWoerkom, Nicholas Zorko, and Julia Halsey

During the late 1960s and early 1970s, medical schools moved away from traditional grading systems and began adopting pass/fail or honors/pass/fail evaluation [1]. It is thought that the impetus for these changes originated with the concern that grade-based learning did not prepare for lifelong learning outside of the academic world and that it suppressed creativity and increased stress [1, 2]. On the other hand, it is well-known that residency directors hold the dean's letter in high regard and favor the more discriminative letter-grade evaluation report [1, 3, 4].

The ultimate quick test in medicine is applying the principle of *primum non nocere* (first do no harm). Is there a possibility that by changing the grading system to a less rigorous, more comfortable pass/fail system we may be harming patients? This would occur indirectly by allowing some students to slip through the cracks of a low-demand education and evaluation system. Gonnella et al. noted that students in need of remediation (not meeting basic standards set for competence in medical education) often went unidentified under a pass/fail system. "Failure to identify students who pass only narrowly results in the suppression of information that is critical to the future development of the students, and is important in the prevention of problems in professional practice" [5]. This does not bode well for patients, even if only a few sub-par students slip through the system without undergoing appropriate remediation.

One example of a problem in professional practice could occur while a student or resident is caring for patients on a hospital team. The extra effort spent by one student studying for an "A" may trigger a memory for the correct tests needed to arrive at a diagnosis and implement an alleviating treatment, a connection that another student who only wanted to pass may not have made. The use of pass/fail grading has been correlated by some groups with poorer performance on exams [8, 9]. Additional information supporting this view was found in a study of surgery residents trained under different grading systems in medical school. Moss et al. found that residents who attended medical schools that assigned grades performed better than those who attended schools that used pass/fail systems [6]. Proponents of pass/fail grading argue that students working in such systems report a greater sense of satisfaction and well-being, but there is evidence refuting this reduction in anxiety upon implementation of a pass/fail grading system [7]. This perceived decrease in anxiety, regardless of validity, may not be worth the decrease in knowledge acquisition that may occur with less rigorous study habits.

Students' personal characteristics and attributes may influence their behavior and attitudes as strongly as a strictly graded traditional system with its intense pressure to perform well—the extrinsic factors—but the two are not easily separated. As one comes closer to measuring an extrinsic factor in medical education, he or she inadvertently affects the intrinsic. Consider, for example, the competitiveness that is said to infect medical students. A student who is willing to pull ahead at the risk of alienating classmates may be innately achievement-oriented, so the cause for his or her behavior is independent of the medical school environment and its pressure to compete.

Many schools have opted for the honors/pass/fail grading system, which does not eliminate the pressure or incentive for students who wish to compete for honors grades. Honors/pass/fail may have the paradoxical effect of placing additional pressure on competitive students to perform even better simply because their grading system fails to discriminate adequately.

A survey of surgery clerkship directors revealed consensus that a three-tiered system did not do enough to differentiate students appropriately. Pass/fail programs, this Ravelli et al. study concluded, "produced little reliable discrimination" between the quality of students and their peers [2]. With this in mind, it is more just to acknowledge a continuum of grades properly than to differentiate only between pass/fail. Consider a student who received the all-time top score for a medical school exam and was given the same grade as a student who passed by one question. This system results in general statements of evaluation for a majority of students without providing a means of recognition for outstanding efforts.

Although many medical schools tout their pass/fail grading system as a means of attracting prospective medical students, these same schools, in truth, rank their students because they know that residency programs want them to distinguish among students. If students are not ranked in a traditional numerical order (e.g., 1/125), they are lumped in quartiles. In order for medical schools to maintain clout in placing their students in competitive residencies, the Medical Student Performance Evaluations (MSPEs) that they send to residency programs must rank students in some useful way. This may even lead to confusion among students regarding their own rank systems.

Turning to the other side of the debate—the argument for pass/fail grading—students have more compelling motivators than grades. Having made it through the weeding process in high school and college classes and even the application process where grades were the most important criteria, medical students need to acquire the knowledge necessary to pass the national boards, obtain residencies and fellowship, and establish a satisfying career. At this point in their medical education, they have greater motivators to learn than simply to get an A on a test.

The letter-grading system also suffers from grade-inflation, which has caused distress in admissions committees and employers of various disciplines. Grade inflation has placed a greater significance on standardized testing as the most objective way for schools to compare candidates from different programs. This in turn, may make the medical board exams a more stressful experience.

While much of this discussion may not seem to be directly related to ethics, in the grand scheme of things, performing at a level which is anything less than one's best has the potential to be detrimental to a patient's well-being and is therefore unethical. The AMA *Code of Medical Ethics* states,

> Incompetence, corruption, or dishonest or unethical conduct on the part of members of the medical profession is reprehensible. In addition to posing a real or potential threat to patients, such conduct undermines the public's confidence in the profession [10].

Therefore, medical students' ethical obligation encompasses the duty to prevent incompetence within their profession.

Steve Prefontaine put it best: "To give anything less than your best is to sacrifice the gift." As physicians or future physicians, we owe it to our patients and society to give our absolute best effort in exchange for the trust and responsibility for their lives they have given over to our care. We have been given a gift and privilege to study and practice medicine and should thus handle it appropriately regardless of the method used to evaluate us.

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Virtual Mentor

CLINICAL CASE
Should Applicants' Ethnicity Be Considered in Medical School Admissions?
Commentary by Will Ross, MD, MPH

The medical school admissions committee was assembled for a meeting, and the first file on the table was Daniel's. After the committee took some time to look over Daniel's file, Dr. Monroe, an older physician and long-standing member of the admissions committee, began the discussion.

"Daniel seems like the ideal candidate to accept into our entering class. His strong MCAT score and GPA, effusive letters of recommendation, and record of leadership and service all indicate that he will thrive at our institution."

Dr. Spence, another member of the admissions committee, added, "I interviewed Daniel and was quite impressed with him. In addition to his remarkable qualifications, I believe that Daniel's fluency in Spanish and his Latino heritage are key assets, especially for communicating with our hospital's patient population."

A number of the members of the admissions committee voiced their agreement, but Dr. Monroe was silent on this point. After a short period of deliberation, Daniel received a unanimous vote of admission, but after the vote was cast Dr. Monroe raised his hand.

"I have a point of concern that I would like to raise up before we go forward with our discussions of the other candidates."

The members of the committee turned to him.

"I may be alone in this, but I am bothered that Daniel's ethnicity was brought up in our discussion. Unfortunately this is not an isolated occurrence but rather an increasingly regular one when we are discussing applicants from underrepresented minority groups. I wanted to assess where our committee stands with regard to using a candidate's ethnic background as a qualification for admission."

He continued, "Yes, in this case Daniel was an excellent candidate and would have been accepted on his credentials alone, but what will we do in the cases in which an applicant from an underrepresented minority group has less impressive qualifications? How much of an advantage would we allow ethnicity or minority status to play in those circumstances? I believe that our sole job as an admissions committee is to admit the most-qualified students, those who will go on to make the best doctors, regardless of their ethnicity."

Dr. Spence interjected, "But don't we also have a duty to the immediate community in which we serve to make sure that the health needs of all of our patients are being met? Our ability to care for patients in part depends on their willingness to confide in us. Many of our hospital's patients are Spanish-speaking, and many of them are more comfortable speaking with a student or doctor who shares their background. If there is miscommunication between a patient and a doctor due to language barriers or cultural issues, then even the best doctor, according to your standards, would not be able to provide that patient with the best care."

"Then where do you draw the line?" asked Dr. Monroe. "I worry that we might be standing on a slippery slope."

Commentary

I have had many conversations about racial and ethnic diversity with members of the admissions committee at my institution, and I always respond that "context matters." I will present my contextually laced argument, relying heavily on the role of beneficence—doing the right thing, as it relates to medical school admissions, patients, and society. According to a 2001 Institute of Medicine study, diversifying the health professions is both the "right thing to do and the smart thing to do" [1]. It is the right thing to do from the standpoint of social justice—African Americans, American Indians, and Hispanics make up approximately 25 percent of the U.S. population but account for only 6 percent of practicing physicians. Such a statistic is unconscionable in a country plagued by almost intractable disparities in health status between members of majority and minority groups [2]. It is the smart thing to do for four essential reasons, as outlined by Jordan Cohen, former president of the Association of American Medical Colleges [3]:

1. High-quality medical education is further enhanced by adequate representation among students and faculty of the diversity of the U.S. society.
2. Increasing workforce diversity will improve access to care for underserved population.
3. Increasing the diversity of the research workforce can accelerate advances in medical and public health research.
4. Diversity among managers of health care organizations makes good business sense.

But does the desirability of having a diversified workforce in medicine create a duty for medical school admissions committees to select students from underrepresented minority groups? Achieving the egalitarian goal of increased diversity in medical schools has its daunting challenges; while the actual numbers of students from underrepresented groups in medicine (URMs) increased from 5,205 in 2002 to 6,393 in 2007, the percentage of applicants who were URMs remained flat at 15 percent [4]. Among the reasons for the small number of candidates from URMs are the increasing attraction of nonmedical professions, the lack of financial capital and social support, poor academic readiness due to substandard public education, and

limited opportunities for networking and mentoring [4]. Medical school admissions committees, cognizant of the need for greater minority group representation in medicine, have to contend with competing for the top students in a very limited pool of candidates. The net effect of this zero-sum game is unhealthy competition among medical schools that treats students like a commodity on the open market and precludes greater collaboration. Clearly a better strategy is needed.

Is Affirmative Action Appropriate in the Context of Medical School Admissions?
Legal challenges to affirmative action have limited the use of race as a factor in the admissions process and placed further constraints on medical school admissions committees. The ruling in the 1996 Hopwood case in the U.S. Court of Appeals 5th Circuit and various referenda against affirmative action, such as the 1996 Proposition 209 in California, had a chilling effect on matriculation of students from URMs in U.S. medical schools [3]. After passage of Proposition 209 in 1996, the percentage of minority medical school California residents studying in-state declined from 23.1 percent in 1993, to 14.3 percent in 1997. Similarly, 1 year after Washington State passed the anti-affirmative action referendum 1-200 in 1998, minority enrollment dropped almost 30 percent, with an entering class of 1.84 percent African Americans, 0.91 percent American Indians, and 2.9 percent Hispanics.

The 2003 U.S. Supreme Court ruling on the University of Michigan case, *Grutter v. Bollinger,* disavowed the use of race-based admissions policies that were not narrowly tailored, while affirming the *Bakke* opinion that "student body diversity is a compelling state interest" and that race and ethnicity could be considered among "other factors" in deciding admissions [5]. Writing for the majority, Justice O'Connor stated:

> In order to cultivate a set of leaders with legitimacy in the eyes of the citizenry, it is necessary that the path to leadership be visibly open to talented and qualified individuals of every race and ethnicity. All members of our heterogeneous society must have confidence in the openness and integrity of the educational institutions that provide this training [6].

Many admissions committees at the more selective medical schools, as well as state schools in more conservative districts, still rely heavily on traditionally quantitative measures of admissibility such as the Medical College Admissions Tests (MCAT) and undergraduate GPAs. Applicants from groups underrepresented in medicine tend to have lower GPAs and MCAT scores than non-Hispanic white applicants, but there is disagreement about the significance and impact of those differences [7]. A meta-analysis of the predictive value of MCAT on medical school performance indicated only a small to medium effect with a predictive validity coefficient of $r = 0.39$ [8]. Cohen noted that in 1990, students from URMs had a graduation rate of 90 percent compared to a graduation rate of 96 percent for white students [3]. The high graduation rate for the former group validated the ability of medical school admissions committees to identify students who were committed to achieving and exceeding the high academic standards of medical schools. From an evidence-based

standpoint, traditional criteria such as MCAT and GPA do not adequately predict medical school performance and should be considered along with other humanistic, nonquantitative variables in selecting the most qualified student to practice medicine.

What Are the Benefits of Ethnic Concordance Between Patient and Doctor?
Affirmative action in medical school admissions is the right thing to do from the perspective of the patient and society. Traditionally, underrepresented groups in medicine (African Americans, Native Americans, and Hispanics) suffer a disproportionate burden of mortality and disability from preventable illness and disease. They are more likely to be uninsured or underinsured and live in communities with limited access to primary care physicians. According to the 2002 Institute of Medicine Report, "Unequal Treatment," disparities in health status persist even after controlling for income status and educational attainment [9]. Consequently, apart from addressing health inequities to ameliorate the adverse economic impact on the country, society has a moral imperative to improve the health of underserved communities by providing access to culturally relevant health care and increasing the diversity of the health care workforce. Kenneth Ludmerer, author of *Time to Heal*, was visionary and forthright in his statement: "The key [to retaining U.S. leadership in medicine] lies in restoring the tattered social contract between medicine and society" [10].

That social contract acknowledges the considerable benefit gained by promoting diversity in the health care workforce. Cantor et al. found that physicians from underrepresented groups were more likely to care for medically underserved groups, including poor and Medicaid patients, than were white physicians [11]. Moy et al. noted that, among patients who reported having a physician as their usual source of care, minority patients were more than four times more likely to report receiving care from minority physicians than were white patients [12]. In a survey of California physicians, Komaromy et al. found significant racial and ethnic concordance between physicians and their patient populations [13]. After controlling for the racial and ethnic makeup of the community, she found that black physicians cared for significantly more black patients and Hispanic physicians, for significantly more Hispanic patients than did other physicians.

Furthermore, efforts to diversify the medical workforce will also expand the practice of culturally and linguistically concordant health care. Increasing culturally sensitive health care can result in enhanced patient-clinician communication, improved patient education efforts, and better health care outcomes stemming from appropriate modification of health behaviors. Citing the limited racial and linguistic concordance between physicians and patients in minority populations, Saha and colleagues found that African American respondents to a 1994 Commonwealth Fund Health Survey were more likely to report receiving preventive care—and all had needed medical care during the previous year if they had an African American physician—compared to those with non-African American physicians [14]. Hispanics with Hispanic physicians were also more likely to be very satisfied with their overall health care compared to those with non-Hispanic physicians. Additional studies are ongoing to

correlate race and linguistic concordance with improved health outcomes and reduction of health disparities.

What Can Medical Schools Do?
Medical school admissions committees typically utter a sigh of relief when they come across an applicant group from a URM whose academic credentials approximate those of the applicants from majority groups. They may have reservations, however, about accepting such candidates with lower credentials, thinking that that student will feel stigmatized as a medical student and underperform based on what Claude Steele calls "stereotype threat" [15]. Committee members can be reassured that, by adopting a more holistic approach to admissions decisions that factors in humanistic attributes such as realistic self-appraisal, leadership, interpersonal skills, presence of social support, compassion, and service along with variables in the cognitive domain such as MCAT and GPA, they are more likely to accept a student eager to meet the health needs of a diverse society [16]. Such students are also more likely to engage in research that can be translated into improved clinical outcomes for the immediate and international community. Medical schools and their admissions committees would be remiss if they did not seek a broader role in expanding the pipeline to students and faculty from URM groups and promoting cultural transformation of medical centers, while engaging students, trainees, and faculty in service learning, neighborhood-based health care, and population-based research.
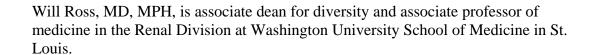
Conclusion
Ultimately, fulfilling the social contract between medicine and society does not and cannot rest solely on the limited number of students from groups underrepresented in medicine. It is a collective responsibility of the profession, and our inability to act reflects an unacceptable moral failure. There are encouraging signs that medical students from all backgrounds are accepting the charge. Saha and colleagues found, for example, that, after adjusting for various school and student characteristics, increased medical school diversity is associated with white students feeling better prepared to care for diverse patients [17]. This bodes well for curricula that emphasize cross-cultural medical education. Medical school admissions committees can act within current legal guidelines in identifying and recruiting students of color while promoting the benefits of diversity on their campuses. Such an approach, operating through beneficence, allows us to fulfill medicine's obligation to society— our schools will be the better for the effort.

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MEDICAL EDUCATION
The Winnowing Fork of Premedical Education: Are We Really Separating the Wheat from the Chaff?
Raymond G. De Vries, PhD, and Jeffrey Gross

It is Welcome Week 2009 at the University of Michigan and we are sitting in a large room where 400 bright-eyed, first-year university students are nervously chatting with each other, waiting for advice on how to successfully navigate their premedical years. These eager young men and women are getting the chance to meet their colleagues (competitors?) and to learn a few facts about the medical school admission process.

Using an interactive PowerPoint presentation, the organizers of the orientation offer information about life as premeds, including (1) who their peers are (25.9 percent of students enrolled in the College of Literature, Science, and Arts expressed an interest in a career in health), (2) their likelihood of getting admitted to medical school (in 2008, 45 percent of the 42,231 applicants to medical schools in the United States were admitted, and at the University of Michigan, 52 percent of those who applied were admitted), (3) the co-curricular activities most desired by medical school admission committees (shadowing, working in an emergency department, helping disabled kids, doing research—although, if you must choose, patient care is preferred over time in the lab), and (4) acceptable reasons for delaying application to medical school past the junior or senior years. An auditorium full of would-be doctors listens intently, scribbling notes on the handouts provided at the door.

And so the premedical experience begins.

Flash back several months to the spring of 2009 and a meeting on a different Midwestern campus. The attendees are medical school faculty and residents; the topic is the use of narrative in the training of medical students. The discussion centers on the sorry social skills of medical students and the need to help the next generation of doctors remember that patients are people with lives, emotions, and relationships—all of which influence their health, the way they hear and interpret diagnoses and recommendations for treatments, and their choice to comply or not comply with medical advice. At one point, a faculty member asks: "What happened to these students? Surely when they entered medical school, they were capable of carrying on a conversation with other human beings."

Well, maybe not. What happens to premeds? How do those eager, high-achieving, gregarious first-year students, intent on careers in medicine, become the drones that need corrective education in the humanities during their medical school years?

Premedical education has an important, but mostly unrecognized influence on the attitudes, character, and moral lives of medical students. When medical educators think about premedical education (which is not all that often) they focus their attention on the substantive content of the premedical curriculum. The "hidden premedical curriculum"—things learned *indirectly* from professors, advisors, peers, relatives, books, the media, and extracurricular activities—is ignored. If we wish to understand the character of first-year medical students, we must first understand the many ways the experience of being a premedical student influences not just performance on the Medical College Admissions Test (MCAT), but ideas about success, relationships, and caring for others [1].

Although it is nearly 100 years old, Abraham Flexner's "Medical Education in the United States and Canada" continues to exert a powerful influence on premedical education. Before the Flexner Report, medical schools varied greatly in their entrance requirements, curriculum, and quality of education [2]. Flexner's desire to bring medical education into the 20th century led him to promote a standardized curriculum that gives "formal analytic reasoning, the kind of thinking integral to the natural sciences…pride of place in the intellectual training of physicians" [3]. The science-oriented premedical curriculum found in virtually all undergraduate institutions today emerged as a response to the need for premeds to prepare themselves for the new scientific education offered by post-Flexner medical schools. In the 10 decades since the publication of the Flexner Report, there have been several efforts to reform premedical education to make the premedical years more relevant to the work of doctoring. Not surprisingly, reformers often disagreed about just what it was that premedical students needed to learn. Some argued for eliminating a defined premedical curriculum altogether, others called for a stronger emphasis on the humanities and social sciences, and, recently, reformers have been making the case for keeping the basic science focus of the curriculum, but with updated requirements—including statistics, business management, and medical ethics—required for the practice of 21st century medicine [4-8].

Notice that all these wished-for changes in premedical education focus on the content of the curriculum and not on the experience of being a premed. While we do not deny the value of substantive preparation in the social and natural sciences and in the humanities, we wish to point out that premedical students learn many lessons as they prepare themselves, and their applications, for medical school. The premedical experience—the strategies learned for succeeding in difficult courses and for grooming one's image for a medical school admission committee—gives students a moral education, showing them what it takes to get ahead, what it takes to become a doctor.

In our review of the guidance given to students on their college's premedical advising web sites we noticed a subtle but important distinction between *developing* and *demonstrating* character [1]. Premedical advisors are aware that the premedical years should both build and reflect the character, but they cannot help being strategic in their advice to students. We discovered that there is a continuum of advice giving.

On one end of this continuum is the *strategic*—"you must do this to satisfy the admission committee"—and on the other end there is advice on *creating character*—"do this to develop the kind of character that will make a good physician." Fine gradations in language distinguish advice on "how to build one's character" from the more instrumental "how to impress an admissions committee."

For example, the University of Virginia tells premeds that doing research will "demonstrate in-depth, sustained scholarly exploration, as well as the presence of lifelong learning skills that are essential in these professions" (emphasis added) [9]. Notice that premeds are not told that research will develop these qualities; rather, the advice is geared toward the strategic goal of demonstrating character. Similarly, premeds at Iowa State are told of the strategic value of extracurricular activities,

> Extracurricular activities that focus on leadership and community service have become *very* important for admission, especially to medical school. Get involved [10].

Advice about the value of volunteer work is much the same. At Wittenburg College, advisors suggest that volunteering 2 to 3 hours each week during the semester demonstrates to the schools your loyalty and commitment to the profession. Premeds at Swarthmore are told:

> If you volunteer either during the school year or the summer in health care related facilities, it shows you are motivated and committed to helping people. It also demonstrates to medical school admissions committees that you have seen firsthand what a medical setting is like [11].

The emphasis is on the strategic—medical school applicants must show or demonstrate their character.

Conversations with premedical students and premedical advisors reveal a disconnect between the views of these two groups toward the premedical years. In the eyes of the advisors, the path to medical school is best described as a journey, the demands of which help students discover their fit with a career in medicine or with the characteristics of different medical schools. Students have a different view, seeing the experience more as a competition than a journey. For them, the time is not a voyage of self-discovery but a set of obstacles to overcome on the way to the elusive goal of medical school admission. Taking their cue from the strategic advice they have been given, they carefully plan their undergraduate years—avoiding classes that might have been helpful to a future physician but might harm their GPA, calculating which clinical and research experiences will look good on their application, and cultivating relationships with professors with the sole purpose of obtaining positive letters of reference.

The American Association of Medical Colleges (AAMC) has recognized that something is amiss in premedical education. Their 2009 report, "Scientific Foundations for Future Physicians," describes the need for change:

This report stems largely from the concern that premedical course requirements have been static for decades and may not accurately reflect the essential competencies every entering medical student must have mastered, today and in the future [8].

The report goes on to note the value of a broad, liberal arts education for the nation's future doctors:

The work of the committee is based on the premise that the undergraduate years are not and should not be aimed at students preparing for professional school. Instead, the undergraduate years should be devoted to creative engagement in the elements of a broad, intellectually expansive liberal arts education. Therefore, the time commitment for achieving required scientific competencies should not be so burdensome that the medical school candidate would be limited to the study of science with little time available to pursue other academically challenging scholarly avenues that are also the foundation of intellectual growth [8].

But, curiously, the report focuses exclusively on the natural sciences, describing eight competencies, all in the natural and physical sciences, that should be acquired in medical school, and eight competencies, again, all in the natural and physical sciences, required of those who enter medical school.

Those who are concerned about the character of our nation's physicians—about their ability to reason morally, to diagnose by listening to patient stories, and to care about patient's lives and not just their cells and organs—must think deeply about the way students land on the doorstep of medical school. When we use the winnowing fork of GPA and MCAT scores, are we separating the wheat from the chaff? Does the premedical experience create medical students with the skills to become healers? On the basis of our research and observations, we suggest a new approach to premedical education—an approach that not only provides the nuts and bolts of recommended coursework and necessary preparation for the MCAT, but that also gives students the opportunity to step back and reflect on the path to a career in health care. Students must realize that the undergraduate premedical experience is not just a means to enter medical school; it is also an experience that is shaping character. The best way to help premeds understand the influence of the hidden curriculum is not another class on ethics or professionalism. What is needed is a course that encourages students, early in their premedical careers, to reflect on their motives for choosing to become a physician, to recognize the influence of the premedical culture on their behavior, and to understand the difference between the demonstration and the development of character [1].

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Virtual Mentor

MEDICAL EDUCATION
The Longitudinal Integrated Clerkship
Ann N. Poncelet, MD, Karen E. Hauer, MD, and Bridget O'Brien, PhD

Longitudinal integrated clerkships (LICs) are one of the first major efforts to restructure core clinical training for medical students. Since the time of the Flexner Report (which will be 100 years old next year), core clinical training for medical students has occurred primarily on inpatient teams in block rotations. The rotations are intended to allow students to work closely with a team of faculty and residents, participate in the care of hospitalized patients, and receive feedback and mentoring from team members who observe their performance over several weeks. Students working with teams during the clerkship years are expected to develop their professional identity as physicians, adopting professional and ethical standards such as honesty, integrity, accountability, and openness and responsiveness to feedback. They are trained to communicate effectively with both patients and colleagues.

As health care delivery has changed over the last 20 years, this traditional structure of clinical training no longer functions as intended. Students rarely spend more than a few days with the same residents, attending physicians, and patients. Shortened rotations, increasing complexity of inpatient illness, and resident duty-hour restrictions limit opportunities for observation, assessment, and feedback with students. Team members may not know their students well enough to provide individualized supervision and mentoring.

The current model of clinical training has many shortcomings:

- Patients often move between hospitals and other care settings, impeding students' ability to follow complete illness episodes or form meaningful relationships with patients.
- With most of their time spent in the hospital, students do not witness medical problems managed in the outpatient clinic and see only the sickest patients with the most complex illnesses in the hospital.
- Students have infrequent exposure to undiagnosed patients and do not become engaged in patients' care until long after the initial assessment by more senior physicians.
- Opportunities for students to have authentic participatory roles on the team are limited.
- The random sequence of block rotations without continuity between rotations results in discontinuous clinical skills development across the third year.

Although medical students trained in the traditional model do acquire core knowledge and clinical skills, their moral development and attitudes toward patients can be adversely affected by their clinical training.

The erosion of ethical behavior and moral reasoning in medical students. A number of studies show that students suffer ethics erosion over the clinical years. In a survey of third- and fourth-year medical students, a majority reported having done something they believed was unethical, having misled a patient, or both [1]. Almost all had heard physicians making derogatory comments about patients, and the majority had witnessed what they believed was unethical behavior by other medical team members and felt they were accomplices to such behaviors. Sixty-two percent believed that at least some of their ethical principles were eroded or lost. Students cited concerns about how they would be evaluated or integrate into the team as contributing factors for their own ethical transgressions.

It is also possible that students' development of moral reasoning is curtailed in current training conditions. Kohlberg postulates that people pass through stages of moral development in a specific sequence as they age and mature. One study found that medical students' moral reasoning stopped progressing over the 4 years of medical school compared to adults in the same age group [2, 3]. This finding is especially troubling because the medical profession holds itself to a higher professional standard than many other professions.

The decline in positive attitude toward patients in medical school. Many students enter medical school with a desire to help patients. They arrive honored to have the opportunity to learn from patients, hear their stories, and, with time, help heal them and improve their lives. Early on, most medical students are inherently interested in patients' experiences of illness and their emotions and preferences. These patient-centered attitudes promote positive patient-doctor relationships and patient satisfaction. Studies that have examined changes in students' patient-centeredness, however, have found declines over the 4 years of medical school [4]. Despite curricula designed to foster these patient-centered attitudes in the preclinical years, experiences in the clinical years lead students to shift to a more doctor-centered perspective of patient care. Patients are approached more as diseases and procedures than people, with biomedical science driving the diagnostic and treatment plans, and minimal consideration given to the individual patient's perspective.

The power of the hidden curriculum. The hidden curriculum has a strong influence on students' attitudes toward patients and their own professional and moral development [5]. All of medical education consists of both a formal and a hidden curriculum. The formal curriculum is explicit and includes objectives and course content. For a clerkship, the formal curriculum might include the disease types or procedural skills a student is expected to learn during the rotation. By contrast, the hidden curriculum is implicit or unintentional and is driven by latent social processes and messages that influence what students do, even if they are taught the opposite [6]. For instance, in a preclinical doctoring course, a student is taught to explore the

social context in which a patient's illness is occurring. When the student moves into clinical rotations in the hospital, he or she observes many residents and faculty omitting this part of the history. The hidden message is that, even though physicians are taught to include social context as part of a history, no one really does it in practice, and therefore it must be unimportant. In the realm of patient management, to take another example, students may be taught to ask for a patient's preferences when determining a treatment. If students never see their teachers eliciting patients' preferences, however, they are less likely to adopt that behavior in future patient encounters.

The Longitudinal Integrated Clerkship and the power of continuity. One way of redesigning clinical training to better support students' learning and professional development is the LIC. This model of clinical training uses continuity as the primary organizing principle for the clinical years [7]. LICs allow medical students to participate in comprehensive care of patients over time, build continuing learning relationships with those patients' clinicians, and meet core clinical competencies across multiple disciplines simultaneously. LICs have been developed across a wide range of settings in rural primary care practices, rural medical centers, urban community hospitals, and urban university medical centers, incorporating the strengths and available resources in each of those settings [8].

LICs are designed to promote patient centeredness. Students develop longitudinal relationships with a panel of patients for whom they provide care over the course of the clerkship, following them during outpatient clinics and acute-care sessions and into various settings such as inpatient wards, specialist clinics, labor and delivery, and the operating room—and they check on the patients between visits via phone or e-mail.

Students are paired with one to eight preceptors ranging from rural primary care physicians to subspecialists in urban academic settings with whom they work over the course of the LIC. Each preceptor is responsible for the core clinical training of his or her student. Preceptorship sessions occur most often in ambulatory settings but can also include operating room or inpatient settings. An integrated curriculum parallels the clinical activities of the LIC and is adapted to students' developmental stage of learning over the year.

Can the LIC model address the ethical erosion and loss of patient-centeredness in medical students and provide a hidden curriculum that has a more positive influence? Outcomes data from LICs worldwide are promising [9-11]. Although standardized written and clinical skills exams are not the primary focus of the model, LIC students' performance on these assessment measures is equivalent or superior to performance of their peers in traditional clerkship. Importantly, LICs have the potential to foster professional development, moral reasoning, and patient-centered attitudes. These benefits can mitigate the negative influences of the hidden curriculum.

The student-teacher relationship can have a powerful influence on the professional formation of medical students, primarily through faculty role modeling of patient-centered care [12, 13]. Longitudinal relationships between students and faculty provide more opportunities for discussion of ethical dilemmas, mistakes, and challenges. Such relationships also increase the likelihood that direct observation and feedback will occur. By knowing and frequently observing their students, faculty members can give regular feedback about professional attributes, including communication skills, interactions with other health professionals, and self-improvement. Our own data from UCSF shows that LIC students rate observation and feedback higher in all disciplines than do their peers in traditional rotations. This benefit has been noted in other programs [11]. Students from the Harvard/Cambridge LIC feel they are better prepared than their peers in traditional clerkships to manage ethical dilemmas, be truly caring, and work with patients of diverse backgrounds [11].

The structure of the longitudinal clerkship sustains students' patient-centeredness. They understand their patients' experience of care and come to know them as individuals instead of as illnesses to be diagnosed and treated. Students can improve patients' care by providing emotional support, communicating information, and facilitating transitions of care. LIC students are more likely than their peers in traditional clerkships to have meaningful relationships with patients, contribute in an authentic way to patient care, and feel valued by their supervising doctor and patients [11, 14]. The experience of the Parallel Rural Community Curriculum (PRCC)-Flinders University in Australia is that LIC students create synergies between patients and clinicians that improve patient care and enable better learning [15]. Similar synergies occur through the students between the university and health service, the government, and community, and between students' own personal principles and the professional expectations of being a physician. In essence, the structure of the learning program positively influences the patients and system in which it is placed.

Longitudinal relationships between faculty and medical students can also be a critical mediating factor for the hidden curriculum [16]. In these relationships, partnerships develop between students and the teachers around both patient care and students' learning. The positive emotional connection that grows over time also creates a safe place to discuss the implicit culture of the workplace and its influence on behavior. For example, on a ward team, the student may observe that asking questions results in negative reactions from the residents and attending physicians, leading to the unintended message that one should never admit uncertainty. The relationship with the longitudinal preceptor provides a chance for the student to ask questions safely with the implicit message being that a good physician is a lifelong learner, always questioning and building his or her knowledge. There are also more opportunities to revisit issues that come up in practice once the student and faculty have had a chance to reflect.

Future Directions for Research
The effect of the LIC model on students' ethical development and patient-centeredness and the influence of the model on the hidden curriculum are important areas for future research. Thus far, no studies have compared moral development or ethical erosion between students in LICs and those in traditional block rotations. There is early qualitative and quantitative evidence of greater patient centeredness in LIC students, some of which has not yet been published. Further study across LIC programs with exploration of students' and patients' perceptions of patient-centeredness in LICs are areas for further development.

The structure of the LIC model deliberately fosters continuous relationships with faculty and patients and can enhance professional identity, ethical behaviors, moral development and professionalism. Through longitudinal relationships with patients, the patient experience becomes central to students' learning. These relationships can temper the powerful deleterious influence of the hidden curriculum on the professional development of medical students. The LIC clerkship shows great promise in comparison to the discipline-based clerkship rotation, not only in traditional measures of competency, such as knowledge and clinical skills, but also in professional and ethical behavior as well. These competencies are critical for future physicians and the medical profession as a whole.

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Virtual Mentor

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MEDICAL EDUCATION
Helping Those Who Need It Most: Medical Education Focused on Poor and Disenfranchised Communities
Charles Vega, MD

Scenario 1: A third-year medical student, eager to help and demonstrate his clinical knowledge in our busy community health center, overstates his ability to understand a patient's preferred language. He misinterprets her symptoms as well as their severity and timing, and he tells the patient she needs to go to the emergency room. The student reemerges from the room quickly and informs the attending physician of this critical case. When the attending visits the patient to confirm her symptoms, he quickly realizes the student's mistake and spends several minutes comforting the frightened patient. The patient becomes upset and says she will never agree to receive care from a medical student again. The medical student is greatly embarrassed and hides in the background for the rest of the rotation, doing the minimum necessary to pass and learning little in the process.

Scenario 2: Another third-year medical student sees a similar patient with a panoply of symptoms. As her mind races to understand what possible pathophysiology could explain her patient's complaints, she realizes that this woman reminds her of an aunt with a type of anxiety disorder specific to her cultural background. The student takes a breath and inquires as to what the patient thinks may be causing her symptoms. The patient hesitates, and then, her eyes fixed directly at her feet, explains that she experienced a great fright last week. The symptoms began after she saw a man being beaten on the street. The student thanks the patient and then describes her findings and diagnosis to the attending physician, and together they devise an appropriate plan of care, including the use of a local healer. The patient is very satisfied and asks the student if she will become her doctor. The student beams and realizes the power and privilege of a strong relationship with patients.

These two scenarios reflect the critical importance of understanding how a patient's background affects his or her perspective on health. Our center, the University of California, Irvine, is not unique in caring for a multicultural community, and we have seen this community grow and evolve over time. The U.S. population is growing more and more diverse, with ethnic minorities accounting for about 25 percent of the total. If current trends continue, minority groups in the aggregate will make up the majority of the population by 2050. Members of these minority groups in the United States lag behind whites in almost every health indicator, while at the same time having higher rates of acute and chronic disease [1]. These health disparities are attributed to barriers in routine access to preventive care, low levels of

efficacy among health professionals in providing culturally sensitive care, and a lack of proportional representation in the health professions [2].

According to the Census 2000 Brief, more than 28 million adults living in the United States speak Spanish as their primary language. Nearly half of this group has limited proficiency in English [3]. Based on census data, the Latino population in California is expected to grow from 10.6 million in 2000 to 21 million in 2025. Meanwhile, in 1999, only 4.8 percent of physicians in California were of Latino descent, creating a ratio of Latino patients to Latino physicians of 2,893:1. The ratio of non-Latino patients to non-Latino physicians in California is 335:1 [4].

The University of California, Irvine, created a comprehensive program to reduce health disparities among Latinos. The Program in Medical Education for the Latino Community (PRIME-LC) is a 5-year, dual-degree program designed to create physician leaders and activists for poor and disenfranchised Latino communities. PRIME-LC scholars complete extra coursework in addition to the regular medical school curriculum, beginning in the summer prior to the first year of medical school. In this busy, 5-week curriculum, students have an immersion experience in Mexico, during which they attend an international conference on health care disparities across borders; accompany Mexican physicians in clinics to help them understand the relationships among patients, physicians, and the health care system in Mexico; and complete the initial class of a 3-course series on health beliefs among Latinos and disparities between health outcomes for Latino and non-Latino populations. These courses are taught by faculty from UCI's Department of Chicano/Latino Studies and provide students with a different perspective on the significance of social justice in health.

All UCI medical students take a longitudinal course in good patient care featuring small groups and standardized patients. Cases for PRIME-LC Clinical Foundations courses have been altered to reflect issues of culture and health, and all of the patient interviews are conducted in Spanish. During clinical experiences, PRIME-LC students are placed in clinics and hospitals with a high number of Latino patients.

Our students need additional knowledge and skills to realize their potential as physician-activists. To this end, all PRIME-LC students are required to complete a master's degree program of their choice, as well as a project related to Latino health. We are proud to incorporate PRIME-LC for the first time in graduate medical education, opening a PRIME-LC residency track in the UCI Family Medicine program in 2010.

Although PRIME-LC candidates must have strong track records of involvement with poor communities and speak Spanish competently, it is not an affirmative-action program. Students must be admitted into the general medical school class prior to consideration for acceptance into PRIME-LC, and our 60 students reflect every major ethnic group in California. In attempting to create a network of physician-activists striving to solve a difficult and multifaceted problem, it is invaluable to

enlist a diverse group of students. These students complement each other's skills and serve as teachers to their peers in their particular areas of expertise.

To sustain our effort in PRIME-LC and the larger battle to improve health care for at-risk groups, recruitment must begin much earlier than application to medical school. PRIME-LC seeks to widen existing opportunities for underrepresented minority and disadvantaged students and build new ones. Our students and professors promote health careers in local high schools, and the School of Medicine hosts students from local junior colleges. There are tremendous numbers of talented young people in schools around the United States who just need a chance and someone to show them the way. These are the students who will, upon graduation, return to their communities in need and deliver highly competent health care.

PRIME-LC enrolled its first class in 2001 and celebrated its first graduating class in May 2009. All graduates chose specialties pertinent to poor Latino communities, and all matched with their top-ranked residency programs. At this time, our program is too young to assess our achievement in creating a network of physician leaders that make a difference. We can be proud, however, of the intermediate outcomes we have achieved:

- Focus on social justice and health. PRIME-LC students have performed comparative research on the use of *promotoras* (lay health workers) in Chiapas, Mexico, and Santa Ana, California. PRIME-LC students have also been integral in the establishment of a student-run free clinic in a village for homeless people 20 minutes from campus. One of the best outcomes of PRIME-LC has been the interaction between the *primistas* and non-PRIME-LC students. The best elements of PRIME-LC have become a regular part of the general medical school experience, and volunteerism and activism are up in the class as a whole.
- Increased number of students choosing medical specialties with an impact on underserved Latino communities. PRIME-LC students receive special instruction and mentoring to begin careers in family medicine, internal medicine, pediatrics, emergency medicine, obstetrics and gynecology, and psychiatry.
- Increased activism in health policy. PRIME-LC has been a significant influence in resurrecting UCI's chapter of the American Medical Student Association as an advocacy group, and UCI now sends the largest contingent of medical students in California to Lobby Day, when students meet with California legislators to promote policies that reduce disparities. Some of our students have also completed internships with legislators with a focus on equality in health care. One PRIME-LC student constructed a paid fellowship with Physicians for a National Health Program, and he has now bequeathed this position to a student from the class following his.

Not every medical school setting boasts the resources to begin a program like PRIME-LC. It is amazing, however, what can happen when a dedicated group of faculty and administrators commits to training future physicians for America's multicultural society. Many of the elements of PRIME-LC can be replicated by emphasizing a conviction toward service and outreach in the regular medical school

curriculum. Continuous exposure to positive role models and mentoring can keep motivated students on the right track. These same students can then return to mentor the next generation, a powerful tool that we very much want to use at UCI.

Diversity is a strength of PRIME-LC and one of the greatest sources of strength for our country as a whole. We look forward to the opportunity of improving the well-being of our diverse communities, both through direct medical care and by addressing the roots of health disparities. Our greatest assets in this effort are the physicians and health advocates themselves, and it is our responsibility as health educators to give them every chance to succeed in their mission.

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Virtual Mentor

THE CODE SAYS
AMA *Code of Medical Ethics* Opinion on Resident Physician Training

Opinion 8.088 – Residents and fellows have dual roles as trainees and caregivers

First and foremost, they are physicians and therefore should always regard the interests of patients as paramount. To facilitate both patient care and educational goals, physicians involved in the training of residents and fellows should ensure that the health care delivery environment is respectful of the learning process as well as the patient's welfare and dignity.

(1) In accordance with graduate medical education standards such as those promulgated by the Accreditation Council for Graduate Medical Education (ACGME), training must be structured to provide residents and fellows with appropriate faculty supervision and availability of faculty consultants, and with graduated responsibility relative to level of training and expertise.

(2) Residents' and fellows' interactions with patients must be based on honesty. Accordingly, residents and fellows should clearly identify themselves as members of a team that is supervised by the attending physician.

(3) If a patient refuses care from a resident or fellow, the attending physician should be notified. If after discussion, a patient does not want to participate in training, the physician may exclude residents or fellows from that patient's care or, if appropriate, transfer the patient's care to another physician or non-teaching service, or to another health care facility.

(4) Residents and fellows should participate fully in established mechanisms for error reporting and analysis in their training programs and hospital systems. They should cooperate with attending physicians in the communication of errors to patients. (See Opinion E-8.121, "Ethical Responsibility to Student and Prevent Error and Harm.")

(5) Residents and fellows are obligated, as are all physicians, to monitor their own health and level of alertness so that these factors do not compromise their ability to care for patients safely. (See Opinion E-9.035, "Physician Health and Wellness.") Residents and fellows should recognize that providing patient care beyond time permitted by their programs (for example, "moonlighting") might be potentially harmful to themselves and patients. Other activities that interfere with adequate rest during off-hours might be similarly harmful.

(6) Residency and fellowship programs must offer means to resolve educational or patient care conflicts that can arise in the course of training. All parties involved in such conflicts must continue to regard patient welfare as the first priority. Conflict resolution should not be punitive, but should aim at assisting residents and fellows to complete their training successfully. When necessary, higher administrative authorities or the relevant Residency Review Committee (RRC) should be involved, as articulated in ACGME guidelines.

This opinion is based on the 2005 CEJA report <u>Resident Physicians' Involvement in Patient Care</u>.

CLINICAL PEARL
Managing the Effects of Shift Work in Medicine
Holger Link, MD, and Robert Sack, MD

Physicians have been practicing in a shift-work environment since the early days of medicine. What has changed is the recognition of how much shift work can degrade the physical and mental performance of physicians, with sleep deprivation in particular impairing not only patient care and safety but also physician health and safety.

The recent mandatory reduction in the work hours in residency was a first attempt to mitigate the effects of shift work and sleep deprivation on residents' performance and education, but the costs and benefits of this reform continue to be hotly debated. The search for the "perfect" work schedule for physicians continues, and the challenges are abundant. The optimal balance between work hours on one hand and training and education on the other is unknown. The new regulations have raised concerns about the fragmentation of patient care and a breakdown in communication during shift changes. Once residents complete training, they move into a system without work hour restrictions. Depending on their specialty, their shift workload may be lighter or heavier than during residency.

A discussion of the effects of shift work on performance should start with a clear definition. Unfortunately, the definition is quite broad, which makes the interpretation of research studies and advice on management strategies more challenging. The American Academy of Sleep Medicine defines shift work as work that "is usually scheduled during the habitual hours of sleep…roster work, or irregular work hours" [1].

Not every physician on a shift-work schedule experiences the same decline of mental and physical performance; there is substantial individual variability in tolerance of shift work and sleep deprivation [2]. A subgroup of physicians experiences more severe effects known as shift-work sleep disorder. This condition is characterized by symptoms of insomnia or excessive sleepiness, either of which may lead to pronounced decline in performance [1]. A study of Detroit shift workers found that approximately 10 percent suffered from shift-work sleep disorder [3]. The exact percentage for physicians is not known. There is also strong evidence that tolerance to shift work decreases with age [4].

Detrimental Effects of Sleep Deprivation
Numerous studies have established the detrimental effects of sleep deprivation and fatigue on performance. Cognitive psychomotor performance after 24 hours of sleep

deprivation is equivalent to that of someone who has a blood-alcohol level of 0.1 percent, well above the legal limit in the United States [5]. A comprehensive study in one of Harvard's intensive care units demonstrated a 56 percent increase in nonintercepted medical errors and more than a 5-fold increase in diagnostic errors made by residents working a 77- to 81-hour work week compared to errors made by those working a 60- to 63-hour work week. (Interestingly, there were still 83 serious medication errors per 1,000 patient days, indicating the sleep deprivation was not the only factor contributing to serious medication errors and pointing toward the need for a systems-based error analysis.) Simulation studies in surgery residents have demonstrated significant declines in psychomotor and cognitive skills post-call [6].

Residents are at risk for drowsy driving and car crashes. A 1-year, web-based, monthly survey of interns showed their odds were 2.3 times greater for a crash and 5.9 times greater for a near-miss when driving home after shifts longer than 24 hours than when driving home after shifts that were not of extended duration [7].

Epidemiologic and laboratory studies strongly suggest increased risk for metabolic and cardiovascular disease in shift workers, and sleep deprivation has been associated with inflammation [8].

To understand the effects of shift work on the body and brain, it is important to review basic principles of normal sleep and sleep regulation. Sleep need is in part genetically determined [9]. Most people need 7 to 8 hours of sleep a night for optimal performance. A small percentage of the population can perform well with 6 hours of sleep or less, and a small percentage needs more than 10 hours. Many are not very good at knowing into which category they fall.

Mechanisms of Sleep Regulation
How does the brain know to sleep at night and how can it stay awake and alert during the day? The current model of sleep regulation proposes two forces, a homeostatic sleep drive and a circadian alerting signal that interact in a ying/yang fashion. Most of us know from experience that the sleep drive gets stronger the longer we have been awake. We may be less aware that the increasing "sleep debt" during wakefulness that eventually drives us to fall asleep is balanced during the day by the circadian alerting system's push to stay awake. Once we fall asleep, we begin to pay off the debt—provided we sleep long enough. Circadian alerting is highest just before bedtime and lowest in the early morning hours.

The good news is that the two-force model of sleep and wake regulation works quite well when we maintain a regular, conventional schedule. The bad news is that the circadian system responds very slowly to abrupt changes in the daily wake/sleep schedule. Indeed, complete adjustment of the circadian rhythm is rare even in permanent night-shift workers [10]. The effects of acute or chronic sleep deprivation can only be reversed by obtaining adequate sleep.

The dilemma with shift work is that it affects both forces that regulate sleep. Long periods of wakefulness increase the sleep drive and can overwhelm the circadian alerting mechanism. So why not just work shorter periods but during the night? The problem here is that it takes many days to align the circadian phase to a new wake/sleep schedule. Even if full alignment is achieved, changing back to regular daylight schedule can be associated with symptoms similar to jet lag. Alternating day and night shifts for just a few nights in a row make it virtually impossible to adapt the circadian rhythm. Another complication is delayed sleep onset or poor quality sleep during off time due to circadian misalignment and environmental disturbances (e.g., light, young children).

Treatment Strategies
There are no treatments that mitigate all of the effects of shift work. It is critical to distinguish those individuals who meet criteria for shift-work sleep disorder because they might benefit from more aggressive interventions.

Treatment strategies aim at correcting the underlying circadian misalignment or sleep deprivation and sleepiness. The specific duration of individual shifts and the number of consecutive night shifts must be taken into account. Shifting the circadian clock would most likely not be beneficial in a work schedule that has single alternating day and night shifts or only a few night shifts in a row.

It is most important to keep the chronic sleep deficit as low as possible. Carrying a chronic sleep debt at the start of a shift-work rotation is like wearing heavy rubber boots for a marathon. Getting 7 to 8 hours of quality sleep on a call-free night is the key foundation for coping with shift work and on-call sleep deprivation. This is easier said than done for most physicians, given the demand to balance work and social life. Making sleep a priority during tough shift-work rotations and enrolling friends and family can help. The bedroom should have a comfortable temperature and be dark and quiet. Exercise and heavy meals should be avoided 2 hours before bedtime. Bedtime should be kept regular with a comforting routine. Alcohol should not be used as a sleep aid because it disrupts subsequent sleep and can lead to dependence.

Napping can be effective in mitigating some of the effects of circadian misalignment and sleep deprivation. It can either be done preventively with a 2 to 3 hour nap before a night shift or by taking shorter naps on the job. Naps as short as 10 minutes improve alertness and cognitive function [11]. Naps shorter than 20 to 30 minutes have a lower risk for inducing sleep inertia—an unpleasant, "dopey" sensation and various degrees of confusion upon awakening. Ideally, naps should be timed to coincide with dips in the circadian alerting signal, typically around 2 to 4 p.m. and 2 to 4 a.m. In practice, this is often difficult to achieve. There is no one-fits-all strategy, and experimentation with the timing and duration of the naps is needed to obtain the greatest benefit. But any amount of sleep is better than no sleep at all.

Treatment strategies aimed at shifting circadian rhythms have focused on appropriately timed exposure to bright light and melatonin administration. Light can act as a phase-shifting (circadian clock resetting) agent and, in addition, has alerting properties. The effect of light exposure depends on what time of the biological day it is given. Light in the morning sets the circadian clock to an earlier time, and light in the evening sets it to a later time. If the aim is to promote circadian adaptation to the night shift, it should be pointed out that bright light in the morning can inhibit inner-clock resetting, which usually occurs via a delay of the clock (i.e., shifting the biological night to a later time). Wearing dark goggles in the morning can lessen this effect and improve adaptation. Bright light during the night shift can help improve alertness and support phase shifting of the circadian system. The ideal light intensity, duration, and timing still have to be determined.

Melatonin is a powerful circadian drug. It has phase-shifting effects when taken in small doses (0.5 to 3 mg) at a specific time in relation to an individual's endogenous melatonin rhythm. Laboratory studies suggest that melatonin may increase total sleep time and promote phase shifting. The evidence from field studies remains mixed.

Caffeine is well known for its alerting properties. Napping for 2.5 hours before the night shift and taking a 4 mg/kg dose of caffeine can improve alertness. Both interventions are effective individually but work best in combination [12]. Another strategy is the consumption of smaller amounts (0.3 mg/kg) of caffeine at hourly intervals during the night [13]. The stimulating effect of caffeine is strongest when it is used tactically for night shifts and not habitually during the daytime because tolerance develops with chronic use [12]. The individual physician should try a variety of strategies to find one that works best. Staying alert from caffeine, however, is no substitute for sleep.

The use of alertness-promoting agents and hypnotics is generally reserved for patients with true shift-work sleep disorder due to cost and side effects. Modafinil, the only FDA-approved drug for shift-work sleep disorder, modestly improved subjective ratings of sleepiness and objective measurements of sleep-onset latency in a clinical trial [14].

In summary, shift work will not go away for physicians. The effects of shift work on performance can be lessened but not fully eliminated. Good sleep habits and adequate sleep on call-free nights are the key foundation for coping with shift work. Tolerance to shift work and sleep deprivation varies among individuals. Medical students and residents should develop awareness for this. It might not be wise for someone with poor tolerance to shift work and sleep deprivation to choose a specialty that requires frequent night call.

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Health Law
When Are Residents Treated as Doctors Under the Law?
Kristin E. Schleiter, JD, LLM

Residents are physicians in transition. As medical school graduates, resident physicians have the basic skills to practice medicine but are not yet at the skill level of specialists [1]. As training progresses, residents "metamorphas[ize] from general physicians to specialists" with graduated, progressive responsibility under the supervision of board-certified physicians [1]. Residents can leave their programs with all the training they need to sit for the qualifying exam and, if they pass, become board certified.

Like any physician, medical residents can find themselves liable for medical malpractice. In a medical malpractice case, the plaintiff-patient must prove to the trier of fact—usually the jury—that the defendant-physician breached the professional standard of care. Expert testimony is often required to establish the prevailing standard of care for a particular specialty or geographic area. While resident liability ultimately depends on several competing factors, a complicating factor is that the standard of care for a medical resident is not well defined. As one court noted, there is a dearth of case law on the correct standard to apply [1]. States vary, for example, in whether they consider residents as interns or physicians and whether the law should treat residents as generalists or specialists. The following cases illustrate the legal debate that has taken place over these distinctions.

Physician versus Student
Rush v. Akron General Hospital. In *Rush v. Akron General Hospital*, for the first time a court created a specific standard of care for a first-year resident to be held to in a medical malpractice case. An emergency room resident was alleged to be negligent for leaving a piece of glass in a patient's shoulder [2]. The Ohio Court of Appeals reasoned that it would be unreasonable to expect from an intern "that high degree of skill which is impliedly possessed by a physician and surgeon in the general practice of his profession" [2]. The court held that a first-year resident should "possess such skill and use such care and diligence in the handling of emergency cases as capable medical college graduates serving hospitals *as interns ordinarily possess* under similar circumstances and localities, with consideration of the resident's opportunity for keeping abreast with advances in medical and surgical knowledge and science" [2].

The *Rush* standard has evolved as courts have taken a closer look at resident physicians' training and skill. In 1982, the court in *Jenkins v. Clark* expressly overruled the *Rush* standard of care, holding that first-year medical residents should

be held to the standard of "reasonably careful physicians or hospital emergency room operators, not of interns" [1, 3]. To establish medical malpractice, the plaintiff must show that the resident physician failed to do (or did) some particular thing(s) that a "physician or surgeon of ordinary skill, care and diligence" would (or would not) have done under like or similar conditions or circumstances [3]. A decade later, the court in *Centman v. Cobb* further modified the *Rush* standard.

Centman v. Cobb. The Indiana Court of Appeals in *Centman v. Cobb* found that first-year residents are practitioners of medicine, required to exercise the same standard of skill as a physician with an unlimited license to practice medicine [4]. *Centman* involved alleged lithium poisoning by two first-year residents. The court focused on the fact that a first-year resident practices under a temporary medical permit while completing the year of practical experience required to obtain an unlimited license to practice medicine. Regardless, the court stated, as a health care practitioner, a first-year resident who assumes treatment and care for patients "impliedly contracts that she has the reasonable and ordinary qualifications of her profession and that she will exercise reasonable skill, diligence, and care in treating the patient" [4]. Residents treat patients and prescribe medicine, holding themselves out as doctors, without representing to patients that they possess less skill or knowledge than that normally possessed by physicians, the court stated [1, 4]. The court concluded that, as practitioners of medicine, residents are bound to possess and exercise the reasonable and ordinary degree of skill, care, and diligence generally possessed, exercised, and accepted by members of their profession who practice in the same or similar localities [4].

In sum, since the early 1980s, courts have tended to treat medical residents, even first-year residents, as true physicians when it comes to the professional standard of care in medical malpractice cases. Courts have also grappled with whether to treat resident physicians as general practitioners or specialists.

Generalist versus Specialist
Pratt v. Stein. In this case, a hospital that employed an orthopedic resident whose negligence resulted in a patient's deafness and paraparesis argued that the court should hold the resident to the standard of care of an ordinary physician, not a specialist [5]. The Pennsylvania Superior Court, which had not addressed the question before, looked for guidance to a lower court ruling in *Harrigan v. United States* [5]. *Harrigan* had held that a specialist "owes to his patient a higher standard of skill, learning, and care than a general practitioner. He is expected to exercise that degree of skill, learning, and care normally possessed and exercised by the average physician who devotes special study and attention to the diagnosis and treatment of those particular diseases within his specialty" [5].

The Superior Court agreed with what it referred to as *Harrigan's* "sound conclusion," saying a resident should be held to the standard of a specialist when the resident is acting within his field of specialty. This rule reflected the fact that residents are already physicians who have chosen to specialize. Therefore, residents

possess a higher degree of knowledge and skill in their chosen specialty than do nonspecialists. The rule also reflected the reality that residents render the vast majority of day-to-day hospital treatment. According to the same court, "it belies logic to assert that a resident authorized to practice his specialty on patients requiring and expecting the services of a specialist should… be judged against the standard used to appraise the reasonableness of a non-specialist's conduct" [5]. Therefore, the court concluded that it should hold medical residents to the standard of a specialist when the resident was practicing within that specialty.

Jistarri v. Nappi. The court in *Jistarri v. Nappi* tweaked *Pratt's* and *Harrigan's* standard of care slightly to focus on a sliding scale standard, holding that an orthopedic resident who negligently applied a cast to a patient's wrist should be held to a standard of care higher than that of general practitioners but less than that of specialists [6]. The court reasoned that the resident in question had more training than a general practitioner but less than a fully trained orthopedist. Hence, it would be unrealistic to require a resident to meet the same standard of care as a fully trained specialist. Residents may have had only days or weeks of training in a specialized residency program, while specialists will not only have completed their residency but may also have had years of experience in their specialized field. The court concluded that, to require the resident to exercise the same degree of skill and training as the specialist would be requiring the resident to do the impossible. Therefore, the court held that residents should be held to a standard of care higher than that for general practitioners but lower than that for fully trained orthopedic specialists [6].

Gonzalez v. St. John Hospital & Medical Center. A Michigan court recently overruled a case from more than a decade prior, *Bahr v. Harper-Grace Hospitals*, which had held that residents are generalists, not specialists. *Gonzalez v. St. John Hospital & Medical Center* involved a third-year resident practicing as a colorectal surgeon. Challenged about the qualifications of the plaintiff's medical expert, the plaintiff argued that a physician can be a specialist without being board-certified in the specialty [8]. Since the resident was receiving advanced training in general surgery at the time of the negligence, the plaintiff claimed, the resident should be considered a specialist in that field [8].

The Michigan Court of Appeals looked to historical precedent to answer the question of whether a resident is a generalist or a specialist. In 1989, the court had refused to permit the expert testimony of an internist and a cardiologist against a resident [8]. *Bahr* in 1993, had held that interns and residents are not specialists [8]. More recently, the court noted, the Michigan Supreme Court in *Woodward v. Custer* held that a specialist is "somebody who can potentially become board certified" [8]. Under this definition, any physician—anyone who has graduated from medical school and passed the U.S. Medical Licensing Exam—who can "potentially become board-certified in a branch of medicine or surgery in which he or she practices is defined as a 'specialist'" for purposes of Michigan law [8]. The court thus read *Woodward* as overruling *Bahr*, and held that residents *can* be specialists. Therefore, those residents who "limit their training to a particular branch of medicine or surgery

and who can potentially become board-certified in that specialty are specialists" for purposes of the standard of care [8].

Courts have attempted to hold resident physicians to an equitable standard of care in medical malpractice cases, mindful of the educational role of residency programs and resident experience while allowing patients who have been harmed a proper route to relief. The standard of care in medical malpractice litigation is an important legal issue that can drastically affect the results of a lawsuit. It seems a fair result to hold residents to a progressively higher standard as their knowledge, experience, and training increases through their respective residency programs.

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Virtual Mentor

POLICY FORUM
Nurturing Leaders for an Environment of Change
Paul Rockey, MD, MPH, and Daniel Winship, MD

Every activity in which the medical profession is engaged has something to do with education. The challenge is to integrate the education of physicians into all other agendas we pursue. This mandate for physician learning derives from the foundational ethics of our profession, specifically, Principle V of the *Code of Medical Ethics* of the American Medical Association:

> A physician shall continue to study, apply, and advance scientific knowledge, maintain a commitment to medical education, make relevant information available to patients, colleagues, and the public, obtain consultation, and use the talents of other health professionals when indicated [1].

Collectively, our current and future patients need ready access to high-quality, increasingly safe, appropriate, and evidence-based care that leads to excellent outcomes and improves health. But the future demands more from medical education than preparing physicians to deliver good patient care. We must make changes throughout the continuum of medical education and training that foster the development of medical leaders who can think and act—with our patients' best interests preeminent—in the service of the profession and our health care system.

To be sure, technical advances will accelerate changes to medical care and how we deliver it; medical school curricula will always have little breathing room; residency training will continue to consume more than 4 years (on average); and maintenance of both certification and licensure will demand that we keep our knowledge and skills current. And it doesn't stop there. We also must be grounded in humanism, act ethically, be steeped in science, and be increasingly competent. Every patient we see deserves this level of commitment. That's a tall order. But it is not enough. Physician learning that focuses only on medical needs of patients is critical and necessary but not sufficient.

Physicians Must Act to Correct Problems in the Health System in which We Work
Whether our nation succeeds in overhauling our health system, the education of our physicians and surgeons must prepare them to serve patients in whatever system we have [2]. As physicians, we must accept personal and collective responsibility for shaping any health system of which we are a part.

Just as we learn to diagnose diseases and develop treatment plans for individual patients, we must also learn to diagnose and treat problems in the systems. Too often

our profession has left this task to administrators, regulators, and insurers. Medical care doesn't end when we leave the patient's bedside or exit the examining room. As public expectations increase, we must help the organizations in which we work adapt, and this will demand new knowledge and skills, the ability to work in teams and problem-solve with our colleagues and other health professionals, to name just two. This commitment is embodied in Principle VII of the *Code of Medical Ethics*:

> A physician shall recognize a responsibility to participate in activities contributing to the improvement of the community and the betterment of public health [3].

The challenge to medical education is to take bright, altruistic, scientifically adept students of every ethnic background and socioeconomic status and imbue them with the knowledge, skills, attitudes, and behaviors that advance patient care and elevate the profession of medicine to its highest potential within society [4].

The profession must learn the same lessons we learned individually as medical students:

- Focus on the health system in which we work.
- Think of our system as a sick patient with multiple problems.
- List the problems and make diagnoses; compare our problem lists with others committed to improvement.
- Work with our colleagues to find solutions for each of the problems we have identified.

Broad Competency Versus Specialization
As medical students, we were all generalists. We took the same courses in anatomy, physiology, and biochemistry; learned the same physical exam skills; and took the same U.S. medical licensing exams. In residency training we differentiated into 24 specialties. Many of us chose additional training beyond that in one of more than 100 subspecialties. Specialization is essential to gain the competence we need to perform highly technical surgical procedures or completely understand the pathophysiology of the heart, for example. But has specialization become an excuse to withdraw from solving systemic problems that affect us all?

Consider the U.S. Army. At the top are generals. At the bottom are specialists (formerly called privates). We expect a lot more from generals than from specialists. Generals must know the roles and responsibilities of all the specialists and officers they command. In addition to that, they must understand strategy and tactics and possess vision and leadership skills. Who are the medical profession's generals?

If the military analogy seems far-fetched, consider business. Many CEOs start as engineers or accountants—specialists. They acquire knowledge and skills as they rise through the ranks. By the time they become CEOs of Fortune 500 companies, they have mastered multiple disciplines. Who are clinical medicine's CEOs?

Or, finally, consider higher education. College presidents and deans often start as specialists in narrow academic fields. By the time they administer a university or college, they have mastered many disciplines and developed a broad understanding of the multiple contributions of their departments, divisions, and faculty members. Who are the presidents and deans in the practice of medicine?

Do we have it upside down in clinical medicine? In our patient care roles, we pay specialists much more than generalists. Too often, our medical culture devalues generalist skills. A medical student who is attracted to the challenge of treating undiagnosed and undifferentiated illness at the front doors of medicine (as a family physician or general internist) is often told he or she is "too bright" to enter primary care and is encouraged by professors (mostly academic subspecialists) to concentrate his or her efforts in a particular clinical niche.

Further, our system of accreditation, certification, credentialing, and licensure narrows medical practice. Systems that were put in place to assure competence and recognize and honor special expertise are now regularly used to stake out and protect economic turf—and, more unfortunately, to divide us as a profession. For many doctors, the longer we practice, the more narrow the range of problems we deal with. Rising to the top of one's specialty in academics or practice is admirable, but from the outside, when things are broken or not working, our segregation by specialties looks like a form of tribalism.

So how can medical education adapt to a paradigm of constant change? Students and physicians in training and in practice with broad interests and ambitions, regardless of specialty, should be encouraged to become leaders in our health systems [5, 6]. That means some of us must become generalists anew. This may involve learning skills in business, public health, and engineering. Regardless, we should create pathways to help our future leaders obtain the additional knowledge and skills they will need to become our medical generals, CEOs, and presidents.

There are some communities that have just that kind of leadership—bright spots on the medical map where doctors and hospitals have focused on improving quality and lowering costs [7]. Two we know well are the Mayo Clinic in Rochester, Minnesota, and Group Health Cooperative of Puget Sound, Washington. One has thrived in the fee-for-service system, the other is a long-time champion of prepaid health care. In both organizations, it has been medical leadership, groomed and exercised over decades, that has made the difference.

Two recent reports noted the need for more emphasis on health system financing and delivery issues in medical school and residency training [8, 9]. Although systems-based practice is one of the six core competencies required by the ACGME, residents are not receiving adequate training in new systems of care, such as the medical home [8]. U.S. medical students have similar concerns about lack of instruction in the practice of medicine and medical economics [9]. All of us, not just students and residents, should learn some basics about health care systems.

Summary

The commitment of the medical profession to education and learning is vital to preparing and maintaining the medical workforce for any health system. This commitment is grounded in the ethical principles of our profession and manifested in the continuum of medical education fostered by the AMA for over a century. Knowledge and technology will advance. Financial incentives will change. Medical practice and health organizations must also adapt. But through all of this, one constant will remain: Sick people will seek care from their doctors, and doctors will care for patients one patient at a time. That brings us to Principle VIII of the *Code*:

> A physician shall, while caring for a patient, regard responsibility to the patient as paramount [10].

Regardless of setting, place, or time, physicians must learn and work together to create health systems that preserve and enhance the value of the patient-doctor relationship. For it is that relationship that is central to the sacred trust society has given our profession.

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POLICY FORUM
Development of a 3-Year Undergraduate Primary Care Curriculum
Richard A. Ortoski, DO, and Richard M. Raymond, PhD

Lake Erie College of Osteopathic Medicine (LECOM) developed an innovative, 3-year medical school curriculum in response to the declining interest in primary care, particularly family medicine. The Primary Care Scholars Pathway (PCSP), one of four student-centered pathways at LECOM, stresses basic-science and clinical-sciences education as well as research and community service. Its mission is to encourage and support students who are interested in primary care medicine—family medicine, general internal medicine, and general pediatrics.

The PCSP is equivalent to a 4-year academic program and was granted approval by the American Osteopathic Association Commission on Osteopathic College Accreditation (AOA COCA) in 2006. A description of and rationale for the program appeared in the September 2007 issue of *Academic Medicine* [1]. The PCSP and the college are linked to osteopathic residency programs through the Lake Erie Consortium for Osteopathic Medical Training (LECOMT) Osteopathic Postdoctoral Training Institution.

PCSP Selection
The PCSP candidate selection process differs from that in the other pathways. All osteopathic college candidates are introduced to the PCSP through the web site and mailed materials. They receive further explanation during admission interviews.

Students interested in PCSP do not matriculate directly into that pathway, but enroll in one of the three other curricula and become candidates for PCSP. They must submit a path-specific application that asks about their education, experiences, and motivation to participate in the PCSP, including a self-assessment of their interest in a primary care career. These students become members of the Primary Care Interest Group and must demonstrate a desire and commitment to the area of primary care, perform well in the initial curriculum common to all pathways—e.g., anatomy or osteopathic principles and practices (OPP)—and exemplify characteristics that are essential to those of a primary care physician. They must be highly disciplined and have a deep understanding of their capabilities and the amount of time necessary to succeed in the PCSP.

The PCSP members are then selected based on the application criteria, a program-specific interview, multiple interest-group meetings designed to elicit conversation among the candidates, and their academic standing upon completing the 12-week common curriculum. Students who are not selected for the PCSP remain in their

original matriculation pathway, but may continue as members of the Primary Care Interest Group.

The PCSP fosters the educational and personal development of medical students by nurturing:
- Lifelong learning skills and personal responsibility for learning.
- A relevant knowledge base characterized by depth and breadth of information.
- Skills in critical evaluation and acquisition of new knowledge.

Achieving these objectives demands a shift in the curriculum emphasis from teaching to learning and requires students to be active, independent learners and problem solvers rather than passive recipients of lecture-style information.

PCSP Curricula
The curricula align with the seven core clinical competencies: (1) osteopathic philosophy and osteopathic manipulative medicine, (2) medical knowledge, (3) osteopathic patient care, (4) interpersonal and communication skills, (5) professionalism, (6) systems-based practice, and (7) practice-based learning and improvement. First-year clinical experiences and ongoing mentoring by primary care physicians over the full 3 years reinforce the connection between the curriculum and these core competencies.

The goal of the primary care pathway is to encourage and enable students who desire careers in primary care to fulfill their aspirations. To modify the 4-year medical school curriculum and deliver it in 3 calendar years requires using available time (i.e., summers) and eliminating redundant medical school electives that students often use to "audition" residency programs in which they are interested. The notion that much of the 4th year is redundant or optional has been corroborated. In October 2008, the Josiah Macy, Jr. Foundation conducted a conference on the mission of medical school education, and the summary of this conference recommended modifying curriculum so that graduation could be achieved in 3 versus the traditional 4 years [2].

All critical components of the undergraduate curriculum receive proper and full attention in the PCSP. The first 2 years are the same as those in the other pathways. Following anatomy, PCSP preclinical studies are divided into a core basic-sciences curriculum and a systems curriculum in which students learn the basic and clinical sciences through case-based modules. This case-based knowledge aids them in the proper clinical practice of primary care medicine. Other courses are presented in a lecture-discussion format.

On the first day in the pathway, students are placed with primary care mentors. After rotating with different physicians, each student is matched with a mentor who remains with him or her until graduation. Faculty are selected to be mentors on the

basis of attributes and attitudes that embody the ideals of primary care. During years 2 and 3, students meet with their mentors one-half day per month, on average.

The accelerated curriculum for the preclinical sciences is achieved by eliminating the 2-month summer break that traditionally occurs between first and second year. The Hospital/Clinical Enrichment Sessions in the first semester of year 2 are devoted to enriching students' understanding of humanism in all areas and practices of medicine among diverse populations. Here they observe interactions between the medical team and the patient and family members and also encounter patients themselves.

PCSP students meet twice a week in years 1 and 2 to discuss core medical concepts with the directors. These concepts are integrated with clinical science through the use of case discussions that prepare the students for monthly Capstone Experiences—discussions that take place during the 16 clinical rotations in years 2 and 3.

Students complete the basic-sciences curriculum by March of the second calendar year. Following successful completion of this phase and the first three clinical rotations, students enter year 3 and complete the final 13 rotations in the spring of the third calendar year.

The osteopathic principles and practices (OPP) are integrated into the 3-year curriculum through teaching by the mentors. In the third-semester OPP course, students have the advantage of developing into table trainers for students in the other pathways, thereby intensifying what they learn in this course. This pathway is the only one with a dedicated third-year clinical rotation in osteopathic manipulative medicine (OMM) that imbues students with the knowledge, techniques, and talents through which OPP philosophy is expressed in daily medical care.

Clerkship Training
The sequence and number of rotations that students begin in March of their second year have been modified to meet the mission and goals of the pathway. LECOM has introduced new core rotations to continue OMM education and other essential primary care medical skills. A final subinternship rotation prepares the students for postgraduate education at their planned residency institutions.

Rotation sites have been selected from LECOMT hospitals based on proximity to the main campus and excellence in primary care clinical training. During year 2 and 3 rotations, students are expected to return to the main campus to participate in monthly Capstone Experiences. They meet with primary care physicians to review basic and clinical sciences in the context of case studies in a modified problem-based learning format.

Table 1 Second academic year rotations

Primary Care Rotations	
1	4 weeks—Family Practice
2	4 weeks—Internal Medicine 1
3	4 weeks—Clinical Overview

PCSP students participate in a Board Preparation Course during their clinical overview rotation. The preparation involves reviewing and testing of basic science and medical education materials that are covered in COMLEX-USA Level 1. Group sessions enhance the review process.

Table 2 Third academic year rotations

Primary Care Rotations	
4	4 weeks—Ob-Gyn or Pediatrics
5	4 weeks—Pediatrics or OB/GYN
6	4 weeks—Internal Medicine 2
7	4 weeks—General Surgery
8	4 weeks—Medical Selective 1
9	4 weeks—Osteopathic Manipulative Medicine or Psychiatry/Comprehensive Review
10	4 weeks—Psychiatry or OMM/Comprehensive Review
11	4 weeks—Medical Selective 2
12-13	8 weeks—Ambulatory Medicine 1 & 2
14	4 weeks—ENT/Ophthalmology
15	4 weeks—Emergency Medicine
16	4 weeks—Subinternship

The 144-week PCSP curricular calendar satisfies the COCA standard of 130-week minimum and is equivalent to a 4-year academic curriculum.

Longitudinal Commitment and Record
PCSP students are required to commit to primary care careers and enter a postgraduate program in family medicine, general internal medicine, or general pediatric medicine. Afterwards they may enter a fellowship training program in geriatric medicine or osteopathic manipulative medicine.

After graduation from a primary care residency or fellowship, students commit to practice that primary care specialty for a minimum of 5 years. Students who change career paths before fulfilling this commitment forfeit their primary care scholarship and must return a full year's tuition to the college [3].

By carefully selecting students, assigning primary care mentors, introducing primary care clinical experiences early, and providing enrichment experiences, LECOM intends to influence the supply of primary care physicians locally, regionally, and nationally.

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MEDICINE AND SOCIETY
Medical Education Meets Health Care Reform
Jordan J. Cohen, MD

Finally, health care reform is back on our national agenda. As of this writing, however, one wonders if anything useful will emerge from what has turned out to be a viciously partisan debate among our elected officials. Amidst all the rhetoric about public options, tax increases, death panels, and rising deficits, there has been little if any discussion about the role that medical education will have to play if we are ever to get true reform of our seriously malfunctioning system.

In this brief article, I highlight four critical aspects of reform that medical educators must find ways to address—the adequacy of the physician supply, the composition of the physician workforce, the geographic distribution of physicians, and last, but far from least, the competencies required of doctors in a meaningfully reformed system.

Adequacy of the physician supply. It goes without saying that a key goal of health care reform—extending health care insurance to those who are presently uninsured or underinsured—will fail to improve the nation's health if doctors are not there to provide the needed care. Which is not to say that doctors could or should do all the work that will be required. Clearly, many other health care professionals will be needed, and are needed now, to ensure access to necessary services. But few would disagree that the number of physicians presently available is inadequate to the task. Indeed, even without the increased demand stemming from universal health insurance, more doctors will be needed in the future simply to care for our growing and aging population.

In recognition of the looming physician shortage, the Association of American Medical Colleges in 2006 called for a 30 percent increase in the capacity of the nation's medical schools over the subsequent decade. Medical educators have responded vigorously; several new schools have been launched, more are in the pipeline, and most existing schools have expanded their class sizes. But producing an adequate number of physicians, while obviously necessary, is hardly sufficient to meet medical education's obligations to support health care reform. Also required is an appropriate distribution of new physicians across the various specialties and geographic regions of the country.

Composition of the physician workforce. One especially problematic feature of the current composition of the workforce is the relative paucity of primary care physicians on the front lines of delivery. Virtually all analysts agree that reform can meet its goals of high-quality, affordable health care for everyone only if the system

rests on an adequate foundation of primary care services. Hence, unless the specialty distribution of the future physician workforce is shifted dramatically from its current skew toward more narrowly defined fields, other sectors of the workforce (e.g., nurse practitioners) will be required to fill the need.

Since the retreat from the managed-care era of the late 1990s, the specialty choices of graduating medical students have veered significantly away from the primary care disciplines of family medicine, general internal medicine, and general pediatrics. The reasons that students abjure primary care are many, and some of the most influential (e.g., lifestyle, income disparity) are clearly beyond the reach of medical education. But medical schools *can* influence several factors that, in aggregate, could help restore a more appropriate balance among the specialties. They can, for example, give careful attention to career aspirations in deciding whom to admit; provide early, positive clinical experiences in primary care settings; ensure the active participation of primary care role models in the educational program; counter the all-too-frequent disparagement of primary care by respected specialists on the faculty; and advocate for improvements in the compensation and working conditions of primary care physicians in the community.

A second especially problematic feature of the current composition of the workforce is the marked skew in the racial and ethnic backgrounds of physicians. Whereas gender parity has been achieved in medical school admissions over the past several years, the gap in admissions continues to grow between the increasingly diverse makeup of the U.S. population and continued underrepresentation of African Americans, Hispanic Americans, Native Americans, and other minority group members. Medical educators must persevere in their efforts both to increase the number of students from minority groups who aspire to become physicians and to achieve racial and ethnic diversity among those admitted. Once again, system reform can fulfill its promise to provide high-quality, affordable care to all Americans only if all physicians are educated in a diverse environment that fully prepares them to deliver culturally appropriate, equitable services.

Geographic distribution of physicians. Achieving an appropriate geographic distribution of physicians has proven to be a particularly nettlesome problem virtually everywhere in the world. Even in the United States, where the overall doctor-to-population ratio is one of the highest in the world, many rural and inner-city communities are woefully short of physicians. The reasons that doctors tend to aggregate in more affluent urban and suburban areas are perfectly clear; that is where they have abundant professional colleagues, more career opportunities for spouses, less-restricted educational options for children, easy access to cultural events, and, of course, better prospects for higher incomes.

Achieving all the objectives of health care reform will be a hollow victory for those who currently live in medically underserved regions of the country if they remain isolated from adequate medical care. Admittedly, medical educators cannot solve the problem of physician maldistribution by specifying where their graduates will

ultimately practice. They can, however, make a concerted effort to recruit and retain medical students who hail from medically underserved communities and who are, as a consequence, more likely than others to return to such communities upon completion of their training.

Physician competencies. Successful health care reform will require that physicians acquire and demonstrate certain competencies beyond the diagnostic and therapeutic skills traditionally thought of in connection with "competent" doctors: (1) patient-centered care, (2) participation and leadership in teams, (3) dedication to quality improvement and patient safety, (4) systems-oriented care, (5) accountability and performance measures, (6) commitment to prevention and health promotion, (7) focus on population and public health, (8) delivery of cost-conscious care, (9) self-directed learning; informatics, and (10) professionalism.

The teaching of several of these nontraditional competencies has heretofore not been high on the agenda of medical education. But to prepare future doctors to fulfill the expectations of a high-performing health care delivery system, medical educators must ensure that newly minted doctors understand the importance of patient-centered care and that they can function effectively as leaders and participants in multidisciplinary teams of health professionals.

To play their essential role in reducing medical errors and improving the overall quality of patient care, future physicians also must acquire intimate knowledge of how complex systems function and must be willing and eager to have their performance in practice measured and held to account. To achieve many of the system reform goals, physicians will be called upon to implement new strategies for health promotion and disease prevention and to incorporate a public health perspective with its emphasis on the health of populations. All of these objectives must be accomplished within a resource-constrained system, requiring educators to inculcate in their students a keen understanding of how to practice medicine with extreme cost-consciousness.

Health care reform efforts have recognized the enormous potential that information technologies have for improving health outcomes and for increasing efficiency. Hence, competency in managing information electronically is yet another skill doctors will need to acquire to function optimally in a reformed system. Increasingly, they will be expected to use IT-enabled means for retrieving information for self-directed learning, ensuring accurate decision making in real time, and fully documenting patient encounters.

Arguably the competency most urgently needed to ensure successful health care reform is an unshakeable commitment to the principles and responsibilities of professionalism. No matter what shape reform takes, no matter how physicians are to be compensated in the future, no matter what structures are created to deliver services, doctors must remain steadfastly adherent to the core principle of professionalism—the primacy of patient welfare. The complexities of human

disease, risks associated with various treatment options, and temptations physicians have to yield to self-interest are all ineluctable features of medicine and, hence, will survive any conceivable transformation of the system. Consequently, for any reformed system to deliver on its promise of high-quality, affordable health care for everyone, future physicians must be strongly grounded in the ethical principles of professionalism and must remain unswervingly dedicated to their patients' best interest.

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MEDICAL NARRATIVE
Learning Bedside Medicine
John Kugler, MD, and Abraham Verghese, MD

The New Faculty Member Perspective
by John Kugler, MD

I hoped it would never come up, that my dirty little secret could remain hidden. My intern year was getting under way and I had little doubt about my cognitive knowledge—I had been successful on test after test throughout my academic career. My only misgiving was in the physical exam. Surprisingly to me, my insecurity with the bedside exam would remain with me through residency, even through chief residency, though it would be tempered by the knowledge that most of my fellow residents were no more skilled than I. Now as I work with medical students as an attending physician, I wonder how my "secret" can shed light on what we are doing wrong and what we might do to have physicians begin their internship with confidence in their bedside skills.

"Don't worry. You will just get the echo," is a phrase I remember keenly, since I found it both reassuring and disturbing. We were first-year medical students struggling to understand murmurs and heart sounds in the introductory physical diagnosis course. We practiced basic exam skills primarily on each other and had standardized patients for the urogenital exams. Later in the year, specialists brought in patients with interesting physical findings and we took turns examining them. The day I heard, "Don't worry. You will just get the echo," was a day when we fought to hear a heart murmur. It was reassuring to think that there was some gold standard beyond my auditory and mental capacity, should I fail to diagnose what was wrong; but it was crushing to let go of that dream so many of us had of bending over a patient with the stethoscope in hand and confidently making a diagnosis.

Trying to learn the reflexes was particularly memorable. Many of us had been quick learners in other disciplines, and it was difficult for us to understand why clubbing the knee over and over again did not produce the desired jerk. The neurologist could make us dance with his long, bending reflex hammer, wielding it more like a magic wand than a medical instrument. Was it because our hammers were shaped more like tomahawks than wands that they produced the desired magic so infrequently? Were we not doing the same motion? Was it really that difficult? While frustrating, the reflexes kept our attention since producing a reflex gives the examiner instant feedback on a job well done. Other exams seemed to become interesting only when disease was present, but as subjects, we were all healthy. We all had the same *lub dub*, vesicular breath sounds, healthy knees and shoulders. The exams seemed

forgettable because there was nothing abnormal to find. Were they also more forgettable because we knew we could just get the echo? Had technology made it unimportant for us to master these skills?

The course was always more interesting when we watched seasoned clinicians at work. I recall being mesmerized as an experienced oncologist showed us how to examine a patient's neck for lymph nodes. I was fixated on his hands; they were so expressive, and, as he touched the patient, they seemed to convey confidence, reassurance, compassion, and experience—all without effort. In contrast, my hands seemed to give away my doubt, my inexperience, my worry and were a testament to my awkwardness. I think it was the residual sense of inadequacy from that encounter that subtly and subconsciously led me to spend as little time touching the patient as I could manage. During the interview I was supremely confident; on matters of science and medicine, I was in my comfort zone; my years as a bartender made it effortless to relate to strangers. *Touching* strangers in the privileged manner that is given to us was a very different story. I always had the notion that patients could see right through me; that they could feel my inexperience and lack of confidence, feel it come off my hands, and that they were one step away from demanding a new doctor.

The seed of insecurity that was planted from watching that oncologist's hands grew to bear a memorable fruit during my internal medicine student clerkship. I had been rotating with a private physician in rural Virginia, and one of his patients was hospitalized with abdominal pain. He had been diagnosed with cholecystitis, but a cholecystectomy did not completely relieve his pain. I had examined him twice, feeling around his abdomen, looking for the cause of his pain and finding none. Later, a CT scan would show the man's spleen extended into his pelvis and across the midline, massively enlarged from lymphoma. When I returned to the bedside with my preceptor, he deftly showed me the outlines of the massive spleen that I had so astutely overlooked. Recalling this particular anecdote would always remind me how the physical exam still matters, so long as it is not done by someone who is inept.

As residency got underway in earnest, it was clear that I was not alone; we were all similarly unprepared to do excellent physical exams, and our focus was on getting enough sleep and doing as little harm as possible. Rounds were usually conducted outside the patient's room or sitting in our work room. If we rounded at the bedside there was no time for the attendings to critique our exam or demonstrate an extensive exam of their own. Our medical school training was supposed to be sufficient—it was amazing how much was taken for granted when we said things like "jugular venous pressure is normal" or "cranial nerves are normal."

There is certainly no easy way to turn students and residents into masters of the exam. My medical school mentor lamented that as residents we would not receive the adequate repetition to hone our skills, given the work-hour restrictions. But lack of repetition is not the problem. Poor technique practiced thousands of times is still poor technique, only now solidly engrained. If we let students know early on that a

sound clinical exam is still an essential part of being a competent physician, we can avoid the trap that many students fall into as they focus their efforts on things that show up on written exams. Students and residents alike need to be observed doing exams, so they can improve their skills and lose bad habits they may have picked up along the way. During my year as chief resident, professor rounds were started as a way to bring students and residents back to the bedside with seasoned clinicians. It was not uncommon to have junior faculty attend the rounds to try to get a better idea of how to teach the physical exam to students. From faculty to students, there was a clear desire to develop strong bedside skills, and making patient rounds with most senior physicians to work on exam skills and interpret their findings was a step in the right direction.

In the next step we need to go beyond the USMLE Clinical Skills Exam and evaluate students' technical skills more vigorously. If students know when they enter their clerkships that they will need to demonstrate proficiency in exam technique by the end of the clerkship, they will undoubtedly focus energy on mastering the physical exam. Having students finish clerkships with a sense of being proficient in the physical exam will give them a head start on being excellent residents and physicians in the years to come.

The Senior Faculty Member Perspective
by Abraham Verghese, MD

John Kugler's candid and heartfelt narrative confirms what I think has happened with bedside skills: we simply are not teaching these skills where they matter most, and that is on the wards during the clerkship and subinternship years, or even in residency training. We get away with it because we use technology so abundantly.

I think a major reason for the decline in skills is that formal testing of these skills does not take place at the end of medical school. The National Board of Medical Examiners, in its USMLE Clinical Skills Exam, does not emphasize clinical skills in the sense of testing *technique*—can the student elicit a normal knee reflex?

Similarly, even after 3 years of internal medicine training, the physical diagnosis skills are not really tested before board certification. As Dr. Kugler describes, we make assumptions that when someone says the exam was "normal," it was, when in fact I think trainees are nowhere as certain about physical findings as they are about the dose of Lasix or the approach to hyponatremia.

I have no doubt that if we attempted to put in place a standardized test using standardized and real patients, with examiners watching for *technique* as well as understanding of the methods of bedside examination, our students and residents would (much as they do in Canada and Britain) spend a lot more time mastering these skills in anticipation of the test. We would be teaching to the test.

The public would be horrified to find that a pilot gets a license without having flown a plane with an instructor sitting next to the pilot and watching every move. But in a sense that is what we do when it comes to the physical exam—there is no testing by an examiner.

I have great confidence in the clinical knowledge and patient management skills of our students and residents, but the area of bedside skills is in need of improvement, particularly if we are to practice cost-effective medicine and minimize a patient's exposure to radiation. Recent studies have shown that a patient's exposure to ionizing radiation as a result of imaging studies can be quite significant, and the long-term ramifications of such exposure have not been studied [1]. Imaging tests are valuable and often necessary, but if simple bedside skills make them unnecessary, then the lack of such skills is not just costly, but dangerous. We have to be sure people can fly before we let them go solo.

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OP-ED
Is an MD Enough?
Leana S. Wen, MD, MSc

It's 5:30 a.m., and you are prerounding after a sleepless night on call. The first chart you pick up belongs to Mrs. M, a 93-year-old woman with dementia brought in by her family for persistent low-grade fevers. All tests are negative so far, and your team is planning an aggressive workup—they are discussing a temporal-artery biopsy then a bone-marrow biopsy. Next is Mr. N, 74, who was diagnosed with idiopathic pulmonary fibrosis in Kenya and came to the United States to get a second opinion. His shortness of breath has worsened. Social work is planning a rehab placement for him because he does not have insurance to pay for oxygen at home. Then there is Mr. C. Forty-three and homeless, with a long history of schizophrenia, Mr. C was admitted for prostatitis secondary to a wound to the rectum self-inflicted with a TV antenna. As you rush to each room in between returning pages and typing orders, you wonder, am I really helping my patients? What can I really do assist Mrs. M with her severe dementia, Mr. N with his terminal diagnosis, and Mr. C with his self-abuse? Has my medical education trained me for this?

This being an article about the "extra-medical" curriculum—what the physician-in-training learns outside of medical school—you might expect me to decry *House-of-God* cynicism because of my extra-medical experiences and to applaud the physicians who pursue training outside of medicine, as the numbers of "triple letter" joint programs such as MBA, MPH, MPP, and MHA multiply. After all, I took 4 years during and after medical school to get my own three-lettered degrees, to do international work, and to lead the American Medical Student Association (AMSA), whose motto, in fact, is "It takes more than medical school to make a physician" [1]. I could say that our health care system made me more sympathetic to its failures in assisting the homeless and mentally ill like Mr. C. I could discuss how being a journalist in East Africa enabled me to better connect with Mrs. M and empathize with Mr. N.

No doubt such extra-medical experiences aid in personal and career development; I am a more well-rounded individual with a better sense of career purpose because of the diverse experiences I've sought. But do we really need for all doctors to be trained in these other pursuits, in business, policy, administration, history, or journalism? Does it really take more than medical school to make a good doctor, to treat Mrs. M, Mr. N, and Mr. C? In this essay, I argue that, while it is paramount to have a comprehensive medical education curriculum that integrates ethics, public health, and professionalism, additional specialized training is *not* necessary. Due to medicine's highly specialized nature, the critical shortage of physicians, and the

increasing focus on incorporating professionalism into medical training, our doctor's degree in medicine or osteopathy, should be enough to enable us to fulfill our social contract as physicians and deliver the best care possible to our patients.

Since Hippocrates' time, medicine has been recognized as a specialized field with key skills and core competencies. Specialization is not inherently a negative thing. Indeed, society expects special expertise of physicians, just as it does of specialists in a variety of other fields. While it makes for more interesting conversation for, say, a pilot to converse about the business model of his airline, and a real estate agent to debate federal environmental laws, it's far more critical for the pilot to know how to fly a plane and the real estate agent to apply local housing regulations. A physician with a JD or MPP is probably a more interesting person, but his or her critical skills as a physician are the clinical skills acquired in medical training. In the United Kingdom and South Africa, where undergraduate education and medical school are combined in a 6-year endeavor, nobody understood why I was pursuing graduate study in economics and policy—wasn't I already a doctor? While this thinking struck me initially as being parochial and narrow-minded, the early specialization and lack of extra-medical curriculum in the United Kingdom (and most of the world) results in a system that produces competent and caring doctors.

The practicality of incorporating extra-medical curriculum into an already overflowing curriculum poses an additional challenge. *Cecil Medicine* begins with a description of the art of medicine and the primacy of human interaction, then instructs the reader to keep the art alive while applying science and utilizing technological advances [2]. As medical sciences break new ground, medical students must acquire a daunting amount of information. To learn more about policy or humanities in medical school would require extending the length of training, an option a minority would choose. At a time when we are facing a shortage of primary care physicians in the United States and working to stem the global brain drain, addressing societal need requires expeditious production of qualified doctors whose primary aim is to practice medicine [3, 4].

But isn't medicine about more than clinical competence? Redressing the lack of attention to social justice and advocacy was the driving mission for the AMSA. Since its inception more than 50 years ago, AMSA leaders have sought to ensure that these key elements that were not taught in medical school were addressed in informal, extracurricular settings. In recent years, academic medicine has recognized the need for formal education on professionalism and service, and now these elements are no longer extracurricular, but are in fact vital elements of medical education. Professionalism is embedded in AAMC philosophies and codified as an ACGME core competency, and elective modules ranging from cultural competency to health policy proliferate [5]. Medical education reformers have taken even more dramatic steps to integrate formerly extra-medical education. For example, a concept of a new system of public health and community and health-oriented medical education, called the U.S. Public Health Medical College (USPHMC) is gaining traction [6]. As presented in the Council on Graduate Medical Education's 18th

Report to Congress, the USPHMC would be a national system of schools that specifically address the shortage, maldistribution, and lack of diversity in the physician workforce by taking aim at the societal concerns of health disparities, public health issues, and emergency preparedness [7]. Tuition for medical school will be waived in lieu of subsequent service. In the ideal system of education that USPHMC exemplifies, there would be no need for extra-medical curriculum—all key elements would be present in the medical education.

Acknowledging that a medical education is sufficient to produce good doctors should not be taken to suggest that medical students stop pursuing other interests. To the contrary, there is a great need for hospital administrators, health care reformers, and public health experts who actually practice medicine. I applaud my classmate with a PhD in aeronautical engineering who is training to be an emergency medicine physician and NASA astronaut, and my friend the Reiki practitioner who wants to advance holistic, family-centered care and research alternative therapies. Those colleagues who kept up other interests and wrote poems, painted watercolors, and went orienteering and mountaineering attest that these passions grounded them; interests outside of medicine help to humanize us in a profession that can be dehumanizing at times. Physicians-in-training who desire additional professional qualifications or wish to pursue personal interests should be encouraged and given opportunities to do so. I argue, simply, that becoming a good physician does not (and should not) require this wide breadth of training in other professions, and that our workforce is best served by having focused training to master core skills in clinical medicine and the art and science that come with it.

Finally, as life-long learners, we should not depend solely on formal education to provide all the tools we need; we should create our own extra-medical curriculum by being conscious about our orientation and focus on service. One of my closest friends, a pediatrics resident, likes to say, "We don't enter medicine to be the king; we enter medicine to be the servant." It's easy to lose sight of our commitment to service in our training. Residency, with its hours, stresses, and steep learning curve can be a dehumanizing process. Even if we don't go to the *House-of-God* extreme, the temptation can be to see our patients as problems and their illnesses as checklists of things that need to be crossed off before we can sleep. But hospitalization is even more dehumanizing. What each of us can do, no matter our level of training, is to change our focus to think actively about serving and advocating for our patients. We should bring in our other life experiences to help us relate to patients and their families. We should work to understand their communities and learn to engage social services to get our patients what they need. We should encourage efforts by our deans to incorporate ethics, social justice, and evidence-based activism into our formal curriculum. How we approach our social contract is ultimately up to us.

You convene a meeting with Mrs. M's family, who tell you that she is a highly religious woman. Upon further discussion with her family and minister, you learn that she never wanted additional medical intervention and that aggressive treatment would be inconsistent with her wishes. You approach an advocacy organization for

immigrants, and, with social-work services, they manage to obtain oxygen and visiting nurse services for Mr. N. A week later, you receive a videoclip of him playing with his grandchildren, who arrived from Kenya to visit him. You research resources for the homeless and mentally ill and get Mr. C accepted to a medical shelter that ensures he takes his antibiotics and psych medications. It is the orientation to advocacy and service that allows you to pursue in-depth discussions with Mrs. M's family, to fight for Mr. N's services, and to guarantee that Mr. C receives continued follow-up. This is being a good physician. Medical education is not about producing the Renaissance doctor, the jack of all trades and master of none, or about the icing on the cake in the form of personal interests and goals. It's about developing specialized skills and knowledge. And it's about being human, connecting with our patients on the fundamental level, and appreciating that we have a real opportunity—a rare and treasured gift—to make a difference in people's lives.

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Virtual Mentor

OP-ED
A Toolkit for Practical Medical Ethics
Douglas Brown, PhD

"The aspect of the bull changes when you move into the arena."—Old Spanish proverb

Autumn Fiester has argued that the principlist paradigm typically taught to medical students and residents leaves them poorly equipped to navigate the ethical complexities associated with patient care [1]. Based on 2 decades of experience with medical students and residents in the hospital setting, I agree with her conclusion. Consider the following scenarios:

A confused third-year medical student, thought by the faculty to be one of the top students in her class, stated soon after her first clinical rotation,

> I am excited about finally being in the clinical setting. I want to help patients. I want to contribute to the team. I understand I need to make my upper level look good. And yes, I want to impress the residents and attendings. But now I feel very uncertain. It's demeaning to be told, "We don't have time for a third-year medical student to do the H/P," and then to be ignored. The one thing I thought I knew how to do was a history and physical. I am afraid of failing, of appearing weak.

A shaken student near the end of his third year, in response to questions about the way he selects rotations and thinks about possible residency programs, realized,

> It's all about balancing residency program status with personal convenience. I am in the rural-track program of my medical school because I began with the intent to practice in an underserved area. But my fellow rural-track students and I hardly ever talk about that goal when we discuss rotations and the residency programs we are considering.

A troubled resident, near the end of his first year, answered, "What have I learned about myself this year? I have learned how mean and selfish I can be."

A second-year ob-gyn resident, during a lunch conversation, admitted,

> By the third year of medical school, I realized that being a physician is not what I had envisioned. Being with patients and making a difference in their lives 90 percent of the time would be great. Even 70 percent. But 40 percent or less? I feel stuck. What else can I do? It is hard to quit after having invested so many years. I am frightened by the ways I have changed. Fatigue

has darkened my mood and shaken my plans. My family and friends do not understand how tired I am. Will these changes reverse after residency?

A young physician, 3 years out from residency, explained,
> The audience in residency is your attending physician. You tend to adopt his or her approach. If you take your own approach, you risk getting into trouble. So you put personal responsibility on a back burner. Your career rides on the attending's interpretation and your upper level's interpretation of your performance. Residents, especially interns, implement the decisions of those above them. Addressing the chief complaint without falling further behind severely restricts attention to deeper issues in the patient's story. This cycle eats away at the joy of what you are doing. Many residents take the position, "When I get out, I won't do it that way." The danger in taking a "later" attitude is that you tend to become what you do.

Fiester argues that the principlist paradigm as a template built around the four classic principles of biomedical ethics (1) lacks the rich and expansive potential for seeing into the ethical dimensions of patient care inherent in the theory of principlism and (2) fails to detect numerous ethically worrisome factors in patient care. She calls for ethics educators to rethink the tools they give medical students and residents. The following sections illustrate how I have responded to this call at Barnes-Jewish Hospital, the teaching hospital for Washington University, St. Louis School of Medicine.

Defining Ethics amid Clinical Realities
Each individual forms a sense of what is of ultimate value and what is of lesser value. These core values serve as a filter through which information is interpreted before being applied to life's decisions. Certain relationships, experiences, circumstances, and objects are regarded as so important to an individual that he or she is prepared to suffer great loss rather than violate them. Judgments about what ought or ought not to be done can usually be acted upon safely without much conflict. Some situations, however, require a collective judgment from a number of individuals with competing goals or divergent viewpoints. Here, a broader approach to decision-making—i.e., ethics—is necessary. Ethics then has to do with the determination of what ought to be done in a given situation, all things and all people considered.

The words "ethics" and "ethical" are used frequently in routine discourse about patient care. In seeking to understand how these words are being defined, I often ask caregivers what they understand to be the ethical dimensions of care in their patient care settings. If and when ethics needs to be reduced to a single concept, I point to the resolve to be respectful. By pausing to consider the etymology of respect (i.e., L., *re + specere*) and to recall the many words that share this root verb and image, we can use this common word as a prism by which to analyze our decisions.

Well-Intentioned People Can Reach Different Conclusions about What Ought to Be Done

Well-intentioned individuals may come to different judgments about what should be done in a given situation because they consider quite different aspects of the situation or they assign different weight, priority, and value to considerations they share. When I go on patient rounds in various care settings, I take copious notes as I move with the team from patient to patient. Some member of the team almost always pulls me aside at some point to ask, "What are you writing down? What are you hearing us say?" I often answer, "I am listening to how you and your colleagues are talking about the experience of caring for the patient. Not so much what you eventually write in the chart, but the discussion that includes your descriptions, emotions, narratives, whispered exchanges, humor, and editorial comments. That discourse reveals what you and your colleagues consider important enough to influence what should be done in caring for the patient."

Based on such observations during rounds, I created a two-part exercise that begins by asking participants to imagine being in the middle of a busy day with a complicated patient. The first part of the exercise introduces in routine language several theories of ethics, each one accompanied by a marginal-to-ultimate scale of weight and importance to the case at hand. The second part of the exercise introduces other considerations I routinely detect on rounds that are rarely addressed in textbooks or courses about medical ethics (e.g., educational benefit, research benefit, fatigue factor, disruption to the day's schedule, staffing limits, tasks that will be passed on to the next team, personal or social plans). These considerations deeply influence the judgments medical team members make about what should be done in caring for a patient.

It is important to encourage conflicted parties to hold as long as possible the assumption that each one is well-intentioned and only surrender the assumption after careful examination produces overwhelming evidence to the contrary.

When and Why Does Trust Break Down in Patient Care?

When I ask caregivers this question, they invariably respond, "Failed communication." A proactive and preventive approach to the ethical dimensions of patient care encompasses communication within its scope.

One of my first collaborations with the staff in our hospital's cardiothoracic ICU was to identify vulnerabilities in the routines of patient care communication that, when they falter in some combination, result in a deterioration of trust and respect. We eventually focused on three vulnerabilities: (1) the information upon which patient care decisions are made, (2) the decision-making process, and (3) the goals that influence patient care decisions. I then developed a tool that provides a construct for examining each vulnerability in two steps—first with a description and then with a set of assessment criteria [2].

In didactic sessions with residents and medical students, I often introduce this tool by first asking the participants to imagine the responsibility engineers have to ensure that bridges and buildings have structural integrity. Bridges and buildings can then be used as metaphors for the delivery of a patient's care from admission to discharge. Such visual aids prepare the participants to explore the link between the structural integrity of the communication infrastructure upon which patient care depends and the ethical dimensions of patient care.

And who is responsible for regularly assessing the communication infrastructure upon which patient care depends? We all are.

Involving Patients and Their Surrogates in Decision Making
Consider the following encounter:
An intern writes orders for the nurse to obtain a urine sample for a drug screen. When the nurse asks for the urine sample, he tells the patient what tests will be conducted. The patient refuses to consent to the drug screen. The nurse tells the intern the patient would not consent. The intern criticizes the nurse for mentioning the drug screen and tells him, "I don't care that he doesn't give consent, go back in there and get the urine and send it. I will deal with it later."

This scenario highlights the disagreements common in the clinical setting over when and how to involve patients and surrogates in decision making. I created a bubble gram to assist residents and medical students think through such cases. This tool identifies four questions that should be asked about shared decision making: "Does this need to be mentioned to the patient?" "Should the patient be made aware though there is no decision to discuss?" "Should the patient be informed sufficiently to be able to question or object?" "Should the patient share in the decision making?"

This tool calls attention to how few activities in the plan for a given day call for shared decision making and opens discussion of the choices other than shared decision making by (1) identifying the factors that influence a medical team's choices and (2) testing a medical team's ability to give ethical justification for whichever of the four choices it will act upon in a given case. The significance of decisional capacity in determining whether to involve patients and surrogates is emphasized.

Sensible Care at Life's End
I asked two residents who were near the end of their medicine ICU rotations, "At any given time, how many of the management plans make no sense to you?" I explained that my question did not have to do with the management plans' internal medical reasoning, but instead with the link between the management plans and feasible outcome expectations. Both residents responded, "Fifty percent."

Discussions between the patient (or surrogate) and the health care team should lead to consensus regarding the patient's expectations for the hospitalization. The patient may refer to expectations such as restoration to preadmission functional status, relief

from pain and suffering, survival regardless of quality of life, or survival long enough for desired closure. Quality of life unacceptable to the patient may include being permanently in one of the following conditions: unconscious, unable to remember or make decisions or recognize loved ones, bedridden and dependent on others for activities of daily living, or dependent on hemodialysis, artificial nutrition, or hydration. The focus of care should be restoring the patient to a level of function compatible with his or her expectations, with all medically appropriate therapies being initiated and continued. If the medical team concludes that such restoration cannot be achieved, further discussion with the patient or surrogate is needed to reconsider the expectations for the hospitalization. Based on this discussion, management may not be escalated, additional interventions may not be introduced, and current life-sustaining treatments may be discontinued, so as not to place undue burden on the patient. In some cases, the focus of care should shift to concentration on the patient's comfort during the dying process. Treatments that serve only to prolong the process of dying or place undue burden on the patient should, in these cases, not be initiated or continued.

Sustaining such communication with patients and their families is an art. I have collected the following list of discussion starters from physicians who have mastered this art:

- What makes for a good day for you? (With attention on how the patient or surrogate defines "good.")
- What are your difficult days like? (With attention on how the patient or surrogate defines "difficult.")
- Do your good days help you make it through your difficult days? (With attention on indications of how firm a "yes" is and whether the good/difficult ratio is diminishing.)
- Do you more often find yourself waking up in the morning hoping for a good day or hoping not to have a bad day? (With attention on how encouraged or discouraged the patient is.)
- What do you want me to know as the team and I consider how best to take care of you? (With attention on acceptable or unacceptable outcomes rather than on management plan details.)
- What outcomes do you want to keep fighting for? (With attention on how feasible the outcomes are.)
- Are you concerned that your illness will interfere with your participation in any activities or events in the near future that are especially important to you? (With attention on what demands these activities or events would make on the patient, how feasible it is for the patient to participate, and what condition the patient hopes to be in at the time of these activities or events.)
- Do you have any questions or worries that are difficult to talk about with your family or friends? (With reassurances that such can be discussed with you in complete confidence.)

- Patients sometimes tell me they find themselves thinking, "That would be worse than dying." Have you had this thought? (With attention on indications regarding what such conditions would be.)

Conclusion

Anxious medical students cope with their disillusionment behind an unstated code of silence, without the means to make meaningful use of ethical theory or of consensus statements in the professional literature. Weary residents wrestle with pressure to focus on priorities other than actions and experiences that would benefit patients. Insecure young physicians stumble through their first few years after residency without mentors to hold them accountable as they sort out their professional values and priorities. They need analytical tools designed specifically for use in the arena.

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