“Instead of being masters of memorization, physicians must become masters of acquiring information from many sources.”

idly hierarchical teams of trainees and students. Little or no attention is paid to the importance of collaborating with other health care professionals. Thus, physicians emerge convinced that they are the sole sources of all important health care decisions, with little experience in functioning as parts of interdependent teams of caregivers. In addition to cutting young physicians off from the perspectives of others who are vital to the provision of excellent care, this mode of training also leads physicians to expect perfection in themselves and to view errors as personal failures.

This approach to educating and training physicians has far outlived its utility. If ever there was a finite body of knowledge that students could assimilate, that time has long since passed. Given the increasing pace of accumulation of medical knowledge, the only surety is that today's knowledge is obsolete tomorrow. Instead of being masters only of memorization, physicians must become masters of acquiring necessary information from many different sources in a timely enough fashion to make correct clinical decisions. The amount of knowledge necessary to practice high-quality health care is just too large and changing too rapidly to be carried around in any person's brain.

Also, physicians must recognize the critical roles played by other members of the health care delivery team (nurses, pharmacists, respiratory therapists, and social workers, to name a few). High-quality health care today can be delivered only by well-functioning, truly interdisciplinary teams. In addition, the training of all health professionals should instill a balance between the importance of striving for personal excellence and the understanding that improving the performance of systems is very often the most effective route to quality improvement. Finally, we must train physicians to be committed to a lifelong process of assessing and improving the quality of care they provide. By reacting far too slowly to these realities, both the settings in which physicians practice and the schools and hospitals that teach them have become part of the problem.

What Must Change?

Changes in three areas are necessary to propel major improvements in health care. As just discussed, we must entirely revamp the education and training of health professionals. We must also improve the effectiveness of our disciplinary procedures in appropriately san-
tioning health care practitioners who repeatedly make serious errors. Third, we must learn how to develop and deploy systems for delivering health services that will either prevent or anticipate and compensate for the errors that human beings inevitably make. We focus on this third area here.

The aviation example. Although our processes and systems for delivering health care have become progressively more complex, we have not yet learned from other sectors of our society that have equally complex systems and for which failure is also a life-and-death matter. Some of these have become highly reliable, with rates of serious errors far lower than those to which we are accustomed in health care. Air travel is a case in point. From 1995 through 1999, 483 people died in aircraft accidents while flying on U.S. commercial airlines. This translates to a death rate of eleven per million departures. By comparison, underuse of proven-effective treatments for heart attacks leads to as many as 18,000 preventable deaths each year. Some 750,000 Americans suffer heart attacks annually and get to hospitals in time for treatment to be initiated; therefore, our failure rate in this one disease is 24,000 preventable deaths per million patients hospitalized, more than 2,000 times the U.S. airlines’ death rate.

High-reliability industries share a simple set of ideas and practices. First, they understand that complex systems make it difficult for even the best-trained and motivated workers to do a good job. They understand and prepare for the most common kinds of errors people make, and they design systems that anticipate and either prevent errors or compensate for them before they do harm. We are only beginning to understand that in health care a large number of preventable bad outcomes bear many of the characteristics of organizational accidents. They are commonly preceded by multiple failures, most of which are ultimately the result of poorly designed systems. Health care systems rely heavily on near-perfect performance by people. Our quality assurance processes emphasize finding the one person to blame for an error and punishing that individual in the expectation that better individual performance will result in fewer errors.

When the National Aeronautics and Space Administration (NASA) investigated a series of airplane crashes in the 1970s, it concluded that the most frequent immediate cause of crashes was failure of the cockpit crew to act as a team. Aviation’s response was to create an entirely new training program—Crew Resource Management—that was designed to foster more effective communications among crew members. It focused on improving performance by improving the rate of error detection and reporting and appropri-
ate and timely action within the structure of the cockpit team. All airlines now use this method of improving teamwork. In health care, with equally or even more complex teams of professionals charged with caring for critically ill patients, real teamwork is rare.

**Barriers To Change**

The effort to create, disseminate, and put in place these numerous new systems and approaches to reducing errors and improving quality is daunting. It demands that all parts of the delivery system—hospitals, physician practices, integrated delivery systems, nursing homes, and hospices—devote their scarce resources to the task. It will require a substantial investment of time, talent, energy, and money. The task is made much more difficult by the fact that there are no exemplars of excellence, institutions, or practices that have succeeded in achieving extremely low rates of errors across all dimensions of quality and across all of the services they provide.

If the evidence of errors and quality problems is so clear and compelling, what is standing in the way of improvement?

- **Little demand for higher quality.** Neither consumers nor their representatives demand higher quality or fewer errors. Survey data indicate that consumers want wide choice among doctors and hospitals, low cost, and unimpeded access to their caregivers; they do not ask for information about quality, health outcomes, or rates of errors. Neither public nor private purchasers of care have used their purchasing power to demand high quality, preferring to focus their efforts on obtaining low prices. Some voices from the purchaser community (such as the Leapfrog Group) are calling for greater attention to quality. Their initial efforts, however, are not focused on obtaining data on performance or improvement. Rather, they will provide information to employees on surrogate measures, such as the volume of services hospitals provide. Even in those rare circumstances when data on quality are available, research shows that neither consumers nor managed care companies use them to select higher-quality providers.

- **Lack of information technology.** Another barrier is the high investment cost of creating the necessary measurement and improvement systems. Information technology (IT) does not yet link the myriad sources of information required to understand quality of care. The price tag is immense for developing and deploying a system to integrate data from doctors’ offices, clinical laboratories, hospital diagnostic imaging facilities, freestanding ambulatory surgery centers, radiation therapy facilities, and hospital medical records. And this list is not exhaustive. Although some commercial products are available to accomplish this task on a small scale, such systems are not available or population-beginning of readily available and on how to alter several interventions to yet additional.

- **Skewed financially sector, today’s when quality.”**)

**Policy Directions**

To make substantial changes in the way we deliver care, we must develop public and consumer interest in quality and accountability. And we must develop the information systems that can support them. Only when consumers have the information they need to judge quality can we begin to see the real impact of quality-based health care on our country’s health and on the productivity and financial performance of employers. 

**Educate**

and fewer errors could improve the ability of organizations in this regard, we recognize the importance of:

- **Reduce**

  systems to gather, analyze, and disseminate data necessary to improve quality of care. This is not just a matter of improving the quality of health care. It is also a matter of improving the productivity and financial performance of employers.
are not available for medium-size or large hospitals, health systems, or populations. Further, assembling computerized data is just the beginning of quality measurement. In most circumstances, data from harder-to-reach clinical sources must be added to the more readily available automated data to produce measures clinicians will believe and on which they are willing to act. Finally, understanding how to alter complex clinical care systems to improve performance, intervening to improve, and sustaining that improvement require yet additional investments.

- **Skewed financial incentives.** Even for organizations that are financially secure enough to consider investing in quality improvement, today’s health care payment environment is perverse. Even when quality improvement and cost savings can be achieved simultaneously, the cost of the improvement is borne by the health care provider, and the savings are often realized by another party. If a hospital reduces the number of unnecessary hysterectomies performed by its physicians, unless it is in the unusual situation of receiving a large share of its payments in the form of capitation, the savings from this improvement will accrue to a managed care company, to a private employer, to Medicare, or to Medicaid. Likewise, a state-of-the-art management program for improving quality and functioning in patients with asthma or heart failure is likely to reduce the number of hospital admissions and, again, reduce hospital revenue.

**Policy Directions**

To make substantial progress toward improving health care quality, we call for a multifaceted strategy that involves all parties.

- **Education.** First, to increase public demand for higher quality and fewer errors in health care, more vigorous efforts to educate the public about quality might be effective. Public and private employers could initiate such efforts by helping their employees to understand that they are not getting the full potential benefit from available health care—that quality problems imperil their health. Organizations representing consumers also have a responsibility in this regard; we note that the problem of overuse has gone nearly unrecognized as a major quality problem by the general public.

- **Reduced expense.** Second, the cost of creating tools and systems to measure and improve quality must be reduced. The federal government should invest far more than it does today in research and demonstrations to build, evaluate, and disseminate the tools that hospitals, physician practices, nursing homes, and integrated delivery systems need. Private foundations should also participate. This effort is exactly analogous to the enormous postwar
injection in the National Institutes of Health (NIH), which led to today's new drugs, medical devices, and treatment regimens. If we are ever to realize the full potential benefit of that investment, we will have to make a large, sustained commitment to investing in quality improvement tools and systems.

- **Financial rewards.** Third, to accelerate the pace of adoption of these tools and systems, purchasers of health care need to develop payment methods that reward excellence in quality. At present, no such method exists. Instead, the traditional fee-for-service mode of payment encourages overuse. Capitation or per case payments encourage underuse. Most providers of care face a bewildering array of payment methods, each with its own set of perverse quality incentives. A large number of valid measures of quality exist today. Purchasers should pay more for high-quality care. They could begin by reserving a portion—say, 10 percent—of their payments for particular services as a premium for high quality. Based on objective measures of quality for these conditions (for example, the proportion of heart attack survivors who are treated with beta-blockers), providers who most often provide all components of effective care would receive higher payments than those with poorer performance. Similar incentives should be designed for controlling overuse and misuse problems.

- **State regulation.** Fourth, although regulation is out of favor, state governments continue to administer programs to identify and punish physicians and other health professionals whose performance is egregiously poor. These programs require substantial improvement. They now devote most of their resources to punishing physicians who abuse patients sexually, traffic in illegal drugs, or violate other criminal laws. They should pay far more attention to identifying and sanctioning physicians who routinely endanger patients because the quality of their care is so inadequate.

State governments can also facilitate the collection, analysis, and public dissemination of key data on health care quality. More state agencies should replicate the program established in New York State more than a decade ago to improve mortality following cardiac surgery.13 The state health department receives data from hospitals on every patient who undergoes cardiac surgery, verifies their accuracy, and publishes risk-adjusted mortality data by surgeon and hospital annually. The improvement efforts undertaken by hospitals throughout the state have resulted in dramatic statewide declines in...
mortality following coronary artery bypass surgery. A study from researchers at Duke showed that New York had the lowest risk-adjusted mortality of any state in the nation in 1992, the fourth year of the program, and experienced twice the national average rate of decline in this mortality rate from 1987 to 1992.14

**Provider leadership.** Finally, health care providers should seize the leadership in error reduction and quality improvement by establishing evidence-based measures for all three kinds of quality problems. They should create model programs for improvement, document their impact, and disseminate their successes. Despite the high cost of such investments and the lack of payment schemes that reward high quality, it is nevertheless possible for providers to craft strategies that take advantage of those instances where quality improvement does result in a favorable impact on the hospital’s or system’s bottom line. If a few such institutions made quality improvement their highest priority in this way, their successes could motivate others by demonstrating what is possible.

A **IMMENSE RESERVOIR OF PROFESSIONALISM** still exists among physicians, nurses, and other caregivers. It is waiting to be effectively mobilized in the service of quality improvement. A great opportunity exists for those institutions that can ignite this enthusiasm and show all of us what truly high quality health care can be.

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**NOTES**


10. Joint Commission on Accreditation of Healthcare Organizations, What Every Hospital Should Know about Sentinel Events (Oakbrook Terrace, Ill.: JCAHO, 2000).


22. Chassin, “Is Health Care Ready for Six Sigma Quality?”
29. Chassin et al., “The Urgent Need to Improve Health Care Quality.”
33. Hannan et al., “Improving the Outcomes of Coronary Artery Bypass Surgery” and Chassin et al., “Benefits and Hazards of Reporting Medical Outcomes Publicly.”