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INSTITUTE OF MEDICINE

Shaping the Future for Health

TO ERR IS HUMAN:
BUILDING A SAFER HEALTH SYSTEM

Health care in the United States is not as safe as it should be--and can be. At least 44,000 people, and perhaps as many as 98,000 people, die in hospitals each year as a result of medical errors that could have been prevented, according to estimates from two major studies. Even using the lower estimate, preventable medical errors in hospitals exceed attributable deaths to such feared threats as motor-vehicle wrecks, breast cancer, and AIDS.

Medical errors can be defined as the failure of a planned action to be completed as intended or the use of a wrong plan to achieve an aim. Among the problems that commonly occur during the course of providing health care are adverse drug events and improper transfusions, surgical injuries and wrong-site surgery, suicides, restraint-related injuries or death, falls, burns, pressure ulcers, and mistaken patient identities. High error rates with serious consequences are most likely to occur in intensive care units, operating rooms, and emergency departments.

Beyond their cost in human lives, preventable medical errors exact other significant tolls. They have been estimated to result in total costs (including the expense of additional care necessitated by the errors, lost income and household productivity, and disability) of between $17 billion and $29 billion per year in hospitals nationwide. Errors also are costly in terms of loss of trust in the health care system by patients and diminished satisfaction by both patients and health professionals. Patients who experience a long hospital stay or disability as a result of errors pay with physical and psychological discomfort. Health professionals pay with loss of morale and frustration at not being able to provide the best care possible. Society bears the cost of errors as well, in terms of lost worker productivity, reduced school attendance by children, and lower levels of population health status.

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A variety of factors have contributed to the nation's epidemic of medical errors. One oft-cited problem arises from the decentralized and fragmented nature of the health care delivery system--or "nonsystem," to some observers. When patients see multiple providers in different settings, none of whom has access to complete information, it becomes easier for things to go

Types of Errors

Diagnostic
- Error or delay in diagnosis
- Failure to employ indicated tests
- Use of outmoded tests or therapy
- Failure to act on results of monitoring or testing

Treatment
- Error in the performance of an operation, procedure, or test
- Error in administering the treatment
- Error in the dose or method of using a drug
- Avoidable delay in treatment or in responding to an abnormal test
- Inappropriate (not indicated) care

Preventive
- Failure to provide prophylactic treatment
- Inadequate monitoring or follow-up of treatment

Other
- Failure of communication
- Equipment failure
- Other system failure

SOURCE: Leape, Lucian; Lawthers, Ann G.; Brennan, Troyen A., et al. Preventing Medical Injury. Qual Rev Bull. 19(5):144–149, 1993.

wrong. In addition, the processes by which health professionals are licensed and accredited have focused only limited attention on the prevention of medical errors, and even these minimal efforts have confronted resistance from some health care organizations and providers. Many providers also perceive the medical liability system as a serious impediment to systematic efforts to uncover and learn from errors. Exacerbating these problems, most third-party purchasers of health care provide little financial incentive for health care organizations and providers to improve safety and quality.

Health Care System at Odds with Itself

The Quality of Health Care in America Committee of the Institute of Medicine (IOM) concluded that it is not acceptable for patients to be harmed by the health care system that is supposed to offer healing and comfort--a system that promises, "First, do no harm." Helping to remedy this problem is the goal of *To Err is Human: Building a Safer Health System*, the IOM Committee's first report.

In this report, issued in September 1999, the committee lays out a comprehensive strategy by which government, health care providers, industry, and consumers can reduce preventable medical errors. Concluding that the know-how already exists to prevent many of these mistakes, the report sets as a minimum goal a 50 percent reduction in errors over the next five years. In its recommendations for reaching this goal, the committee strikes a balance between regulatory and market-based initiatives, and between the roles of professionals and organizations.

One of the report's main conclusions is that the majority of medical errors do not result from individual recklessness or the actions of a particular group--this is not a "bad apple" problem. More commonly, errors are caused by faulty systems, processes, and conditions that lead people to make mistakes or fail to prevent them. For example, stocking patient-care units in hospitals with certain full-strength drugs, even though they are toxic unless diluted, has resulted in deadly mistakes.

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Thus, mistakes can best be prevented by designing the health system at all levels to make it safer--to make it harder for people to do something wrong and easier for them to do it right. Of course, this does not mean that individuals can be careless. People still must be vigilant and held responsible for their actions. But when an error occurs, blaming an individual does little to make the system safer and prevent someone else from committing the same error.

Strategy for Improvement

To achieve a better safety record, the report recommends a four-tiered approach:

- **Establishing a national focus to create leadership, research, tools, and protocols to enhance the knowledge base about safety.**

Health care is a decade or more behind many other high-risk industries in its attention to ensuring basic safety. This is due, in part, to the lack of a single designated government agency devoted to improving and monitoring safety throughout the health care delivery system. Therefore, Congress should create a Center for Patient Safety that would set national safety goals and track progress in meeting them; develop a research agenda; define prototype safety systems; develop, disseminate, and evaluate tools for identifying and analyzing errors; develop methods for educating consumers about patient safety; and recommend additional improvements as needed.

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Funding for the center should be adequate and secure, starting with $30 million to $35 million per year and growing over time to at least $100 million annually--modest investments relative to the consequences of errors and to the resources devoted to other public safety issues. The center should be housed within the Agency for Healthcare Research and Quality (AHRQ), which already is involved in a broad range of quality and safety issues, and has established the infrastructure and experience to fund research, education, and coordinating activities.

- **Identifying and learning from errors by developing a nationwide public mandatory reporting system and by encouraging health care organizations and practitioners to develop and participate in voluntary reporting systems.**

Under the mandatory reporting system, state governments will be required to collect standardized information about adverse medical events that result in death and serious harm. Hospitals should be required to begin reporting first, and eventually reporting should be required by all health care organizations. This system will ensure a response to specific reports of serious injury, hold health care organizations and providers accountable for maintaining safety, provide incentives to organizations to implement internal safety systems that reduce the likelihood of errors occurring, and respond to the public's right to know about patient safety. Currently, about a third of the states have mandatory reporting requirements.

Voluntary reporting systems will provide an important complement to the mandatory system. Such systems can focus on a much broader set of errors, mainly those that do no or minimal harm, and help detect system weaknesses that can be fixed before the occurrence of serious harm, thereby providing rich information to health care organizations in support of their quality improvement efforts. To foster participation in voluntary systems, Congress should enact laws to protect the confidentiality of certain information collected. Without such legislation, health care organizations and providers may be discouraged from participating in voluntary reporting systems out of worry that the information they provide might ultimately be subpoenaed and used in lawsuits.

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- **Raising performance standards and expectations for improvements in safety through the actions of oversight organizations, professional groups, and group purchasers of health care.**

The process of developing and adopting standards also helps to form expectations for safety among providers and consumers.

Setting and enforcing explicit performance standards for patient safety through regulatory and related mechanisms, such as licensing, certification, and accreditation, can define minimum performance levels for health professionals, the organizations in which they work, and the tools (drugs and devices) they use to care for patients. The process of developing and adopting standards also helps to form expectations for safety among providers and consumers.

Standards and expectations are not only set through regulations, however. The values and norms set by the health professions influence the practice, training, and education for providers. Thus, professional societies should become leaders in encouraging and demanding improvements in patient safety, by such actions as setting their own performance standards, convening and communicating with members about safety, incorporating attention to patient safety in training programs, and collaborating across disciplines.

The actions of large purchasers of health care and health care insurance, as well as actions by individual consumers, also can affect the behaviors of health care organizations. Public and private purchasers, such as businesses buying insurance for their employees, must make safety a prime concern in their contracting decisions. Doing so will create financial incentives for health care organizations and providers to make needed changes to ensure patient safety.

- **Implementing safety systems in health care organizations to ensure safe practices at the delivery level.**

Health care organizations must develop a "culture of safety" such that their workforce and processes are focused on improving the reliability and safety of care for patients. Safety should be an explicit organizational goal that is demonstrated by strong leadership on the part of clinicians, executives, and governing bodies. This will mean incorporating a variety of well-understood safety principles, such as designing jobs and working conditions for safety; standardizing and simplifying equipment, supplies, and processes; and enabling care providers to avoid reliance on memory. Systems for continuously monitoring patient safety also must be created and adequately funded.

Medication errors now occur frequently in hospitals, yet many hospitals are not making use of known systems for improving safety…

The medication process provides an example where implementing better systems will yield better human performance. Medication errors now occur frequently in hospitals, yet many hospitals are not making use of known systems for improving safety, such as automated medication order entry systems, nor are they actively exploring new safety systems. Patients themselves also could provide a major safety check in most hospitals, clinics, and practice. They should know which medications they are taking, their appearance, and their side effects, and they should notify their doctors of medication discrepancies and the occurrence of side effects.

Progress Under Way

The response to the IOM report was swift and positive, within both government and the private sector.

Almost immediately, the Clinton administration issued an executive order instructing government agencies that conduct or oversee health-care programs to implement proven techniques for reducing medical errors, and creating a task force to find new strategies for reducing errors. Congress soon launched a series of hearings on patient safety, and in December 2000 it appropriated $50 million to the Agency for Healthcare Research and Quality to support a variety of efforts targeted at reducing medical errors.

The AHRQ already has made major progress in developing and implementing an action plan. Efforts under way include:

- Developing and testing new technologies to reduce medical errors.
- Conducting large-scale demonstration projects to test safety interventions and error-reporting strategies.
- Supporting new and established multidisciplinary teams of researchers and health-care facilities and organizations, located in geographically diverse locations, that will further determine the causes of medical errors and develop new knowledge that will aid the work of the demonstration projects.
- Supporting projects aimed at achieving a better understanding of how the environment in which care is provided affects the ability of providers to improve safety.
- Funding researchers and organizations to develop, demonstrate, and evaluate new approaches to improving provider education in order to reduce errors.

Casting its net even more broadly, the AHRQ has produced a booklet of practical tips on what individual consumers can do to improve the quality of health-care services they receive. The booklet focuses on key choices that individuals and their families face, such as choosing doctors, hospitals, and treatments, and it stresses the importance of individuals taking an active role in selecting and evaluating their care. (The booklet is available on the organization's Web site at www.ahrq.gov.)

In efforts focused at the state level, during the past year the National Academy for State Health Policy (NASHP) convened leaders from both the executive and legislative branches of the states to discuss approaches to improving patient safety. The NASHP also helped lead an initiative to better understand how states with mandatory hospital error-reporting requirements administer and enforce their programs. (A report on this initiative is available on the organization's Web site at www.nashp.org). In addition, the Agency for Healthcare Research and Quality has contracted with the National Quality Forum to produce a list of so-called "never events" that states might use as the basis of a mandatory reporting system.

Among activities in the private sector, the Leapfrog Group, an association of private and public sector group purchasers, unveiled a market-based strategy to improve safety and quality, including encouraging the use of computerized physi-

cian-order entry, evidence-based hospital referrals, and the use of ICUs staffed by physicians credentialed in critical care medicine.

Professional groups within the health-care community also have been active. As but one example, the Council on Graduate Medical Education (COGME) and the National Advisory Council on Nurse Education and Practice (NACNEP) held a joint meeting on "Collaborative Education Models to Ensure Patient Safety." Participants addressed such issues as the effect of the relationships between physicians and nurses on patient safety, the impact of physician-nurse collaboration on systems designed to protect patient safety, and educational programs to ensure interdisciplinary collaboration to further patient safety. (A report on the meeting is available on the COGME's Web site at www.cogme.org.)

Pulling Together

With adequate leadership, attention, and resources, improvements can be made.

Although no single activity can offer a total solution for dealing with medical errors, the combination of activities proposed in *To Err is Human* offers a roadmap toward a safer health system. With adequate leadership, attention, and resources, improvements can be made. It may be part of human nature to err, but it is also part of human nature to create solutions, find better alternatives, and meet the challenges ahead.

For More Information…

Copies of ***To Err is Human: Building a Safer Health System*** are available for sale from the National Academy Press; call (800) 624-6242 or (202) 334-3313 (in the Washington metropolitan area), or visit the NAP home page at **www.nap.edu.** The full text of this report is available at **http://www.nap.edu/books/0309068371/html/**

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Study Staff

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MOLLA S. DONALDSON, Project Codirector
LINDA T. KOHN, Project Codirector
TRACY McKAY, Research Assistant
KELLY C. PIKE, Senior Project Assistant

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