While medical care in the United States is undoubtedly among the best in the world, recent studies have revealed that medical errors—preventable adverse events resulting from medical management as opposed to the disease or condition of the patient—occur on a surprisingly regular basis.

"To Err Is Human: Building a Safer Health System," a study released by the Institute of Medicine (IOM) in 1999, reported that medical errors are responsible for between 44,000 to 98,000 deaths annually. Estimated annual costs of all adverse events range from $38 billion to $50 billion nationally. These figures are all the more tragic because over half of these events could be prevented.

State and national policy makers realize the importance of taking steps to reduce errors, not only to address safety concerns on behalf of patients but as a way to address increasing health care expenditures. In an effort to help inform these policy makers, CSG invited a distinguished panel of experts to share their perspectives on medical errors and patient safety as part of a Health Policy Teleconference hosted January 11, 2001. Panelists included: Dr. David Lawrence, Chief Executive Officer and Chairman of the Boards of the Kaiser Foundation Health Plan and Kaiser Foundation Hospitals, and a member of the IOM committee that released the medical errors report; Senator Richard Moore, Chairman of the Joint Committee on Health Care and the Joint Committee on Insurance in the Commonwealth of Massachusetts; and Nancy Foster, Coordinator for Quality Activities at the Agency for Healthcare Research and Quality.

What Goes Wrong and How Often?

According to the IOM report, two studies—one done in New York using data from 1984 and a second conducted in Colorado and Utah using 1994 data—found that 2.9 percent and 3.7 percent, respectively, of hospital admissions experienced an adverse event due to medical management of their care. Of this amount, 58 percent in New York and 53 percent in Colorado and Utah were considered preventable. If these percentages are applied to all hospital admissions in the United States, the costs of preventable adverse events ranges between $17 billion and $29 billion with over one-half of this amount going exclusively toward health care costs. This figure represented roughly 2 percent of total national health care expenditures in 1996.

Medical errors resulting in harm can generally be classified into four categories—diagnostic, treatment, preventative, or other (Figure 1). In practice, these errors could take the form of transfusion and adverse drug events; wrong-site surgery and surgical injuries; preventable suicides; restraint-related injuries or death; hospital-acquired or other treatment-related infections; and falls, burns, pressure ulcers and mistaken identity.

As the number of medications prescribed to hospital patients increases, the number of drug-related errors increases as well. According to a report by the Agency for Healthcare Research and Quality, "Over 770,000 people are injured or die each year in hospitals from adverse drug events, which may cost up to $5.6 million each year per hospital, depending on hospital size." Children are especially at risk due to the increased possibility of incorrect dosages.

Why Errors Occur

"Errors are the result of failures of the system—failure of the organization of health care—not the result of incompetence or lack of caring on the part of individuals," Dr. Lawrence said. To illustrate this point, Dr. Lawrence provided two examples. The first example is an actual case related to work environment, and the second describes...
how operational procedure contributes to error.

- Within two years of changing hospitals, three surgeons who had never experienced a wrong-site surgery event all experienced such an incident at least once. An investigation revealed that the nursing staff in the new hospital operating room functioned quite differently from that in the hospital at which the surgeons had worked previously. In the first hospital, the nurses were comfortable confronting the doctors when they suspected mistakes. In the second hospital, the operating staff felt less confident in communicating with the surgeons, worrying how the doctors would respond. In this instance, the errors were not the result of the doctors becoming less knowledgeable. They lost the team atmosphere of the first hospital, where each member of the operating staff felt comfortable in correcting the other. In response, the hospital where the incidences occurred conducted trainings to help people talk with one another, to be more direct with one another and not overwhelmed by the notion of hierarchy that is so deeply ingrained in medicine.

- In most hospitals, it takes anywhere from 30 to 60 steps to give a patient a medication that has been ordered by a physician. At each step, an opportunity for a mistake presents itself—from the piece of paper on which the prescription is written and the legibility of the penmanship, to what happens when the pharmacy fills the prescription, to the arrival of the medication on the floor and the administering by nursing staff. The complexity of this task increases the likelihood of severely harming the patient, or, in extreme cases, killing the patient.

Dr. Lawrence explained that the prevalence of errors lies in how the system of health care has developed over the years. "Medicine has become probably the most complex service that is given in any sector of our lives. Since World War II, the science of medicine and the technologies that medicine employs have grown exponentially, and the organization of medicine has not kept pace. We still deliver medical care primarily through a single doctor or a small group of doctors—through isolated hospitals that are not part of systems—and we lack the kind of organization and thoughtful integration that is critical to delivering medical care in a way that is safe and consistent."

Hospital staffing also plays a role in the occurrence of adverse events. "Staffing levels, long work hours, sleep cycles, fatigue—these issues are paramount in discussions of incidences of medical error," Nancy Foster said. Currently, the Agency for Healthcare Research and Quality is funding eight projects examining the critical issues of how staffing, fatigue, stress, sleep deprivation, organizational culture, shift work, and other factors can lead to errors. Senator Moore detailed some of the debate going on in Massachusetts. "Our concern is that you need to look beyond mandatory staffing levels because the number of hours anyone should be able to work in a given cycle also has to be considered."

Dr. Lawrence agreed that minimum staffing requirements must be thought through carefully. "We have to keep in mind that the rate at which the practice of medicine, and the needs of organizations, are changing in response to the science and technology that is emerging is unprecedented. Legislation that freezes the health care system, or makes it extremely difficult for innovation in the delivery system to occur, should be avoided."

### Preventing Errors—Improving the System of Care

Since the publication of the IOM report, the response from all levels of government, provider groups, insurers, and public advocacy organizations has been tremendous. Issues for discussion include: mandatory and voluntary reporting requirements; electronic transmission of prescriptions and other testing and evaluation procedures; using the buying power of state insurance plans to require hospitals have systems in place for tracking and preventing errors; and efforts to address staffing issues.

### Reporting

In "Medical Errors and Patient Safety in Massachusetts: What is the Role of the Commonwealth," the Massachusetts Health Policy Forum asked how the atmosphere of liability and blame associated with reporting mistakes can be transformed into one of learning and safety. Looking to other industries for guidance, the report offered the Aviation Safety Reporting System (ASRS) as one example of a complex industry that has successfully implemented a data gathering system. By limiting liability for non-criminal offenses, the ASRS has collected over 500,000 confidential reports that have led to the redesign of aircraft, air traffic control systems, airports, and pilot training programs.

But how does one apply the lessons learned in aviation to health care? Many states have created either mandatory or voluntary report-
Medication errors represent one of the most common types of medical errors. Some states look at improved penmanship as a possible solution. In Washington, for example, legislation requiring physicians to report errors where no criminal act took place. "Even within a confidential system, there has been reluctance on the part of the professionals to report either their own error or someone else’s. We get some, but there is a lot more that goes on," Senator Moore said.

To get the information necessary to understand the root causes of errors and to test various approaches to improving care, people need to feel that they are not indicting themselves when they report errors they have made, said Nancy Foster. "Liability is an issue state legislators can address," said Dr. Lawrence. Senator Moore suggests states work with insurers as well as bar associations when drafting legislation that would protect health care professionals from litigation when reporting errors where no criminal act took place.

Use of Technology

Medication errors represent one of the most common types of medical errors. Some states look at improved penmanship as a possible solution. In Washington, for example, legislation requiring physicians write prescriptions legibly took effect during the summer of 2000 ( HB 2798). However, Michael Cohen, president of the Institute for Safe Medication Practices, feels the bill will have little impact in reducing errors. Not only will the law be difficult to enforce, Cohen believes that until prescription writing is computerized, "a focus on handwriting does nothing to ensure necessary information is available to avoid drug interactions, overdoses, and allergic reactions."9

Such automated systems may prove more effective in reducing error: "Brigham & Women’s Hospital in Boston has been an early pioneer in requiring not only medication, but even some procedures like X-rays be ordered by computer," said Senator Moore. All professionals, whether it’s a nurse practitioner or doctor who has the authority to issue a prescription, are required to use the electronic system.

Information available concerning efforts by the U.S. Department of Veterans Affairs and the U.S. Department of Defense provide further proof of the effectiveness of computerized systems. "Electronic medical records and interactive decision-support tools have the potential to allow health care providers timely knowledge of a patient’s history and improve clinical care. Electronic access to a patient’s charts removes uncertainties regarding the patient’s health history [and] . . . can give physicians, nurses, and other providers essential access to the most current results of consultations, laboratory tests, x-rays, and other studies, and to previous test results."10

Protecting against fraud and maintaining confidentiality with such systems does not appear to be an issue. According to Dr. Lawrence, Kaiser’s experience with automated systems shows they are actually far more rigorous than non-automated systems for managing fraud. "You have immediate information about what has been used, what has been ordered, what has been dispensed. We found both with automated pharmacy systems, and also with automated medical records systems, that the incidence of fraud, of misuse, and of security breaches, is actually lower than with paper records," said Dr. Lawrence.

Purchaser Requirements

Considering safety as well as cost when selecting a health insurance plan is one of the recommendations made by the Quality Interagency Coordination Task Force in its report, "Doing What Counts for Patient Safety." A Massachusetts bill, for example, would require all state agencies that contract for health services to assure in those contracts that their partners are following major patient safety initiatives such as computerized medication order entry ( SB 567). "Traditionally, health plans and other insurers have not provided incentives to the providers to focus on patient safety and medical error reduction. This year, the Group Insurance Commission has made safety a part of the contracting process," Senator Moore said.

Staffing Issues

Many states are looking at requiring mandatory staffing levels and limitations on number of hours worked per shift. Nursing shortages,
however, affect this type of legislation’s impact. In Massachusetts, several bills have been proposed to increase the number of nurses by offering state funds to hire new nurses who are in the upper end of their classes and by providing grants to mentoring programs (SB 2077).

“Our Board of Registration of Medicine is telling us that the bulk of the nurses who leave the profession do so within the first year of entering it, because the realities of the position were not what they expected, and no one was there to really help them work through the system,” said Senator Moore. Massachusetts is also looking into scholarships and loan forgiveness to attract more people into nursing.

**Cost Concerns**

The cost of initiating the suggestions discussed above may seem prohibitive, especially in a slowing economy. However, as Senator Moore questioned, “How can we not put some of these recommendations into practice?” Senator Moore argued that programs such as electronic prescriptions will lead to increased savings in the long run because hospitals will not have the expense of fixing mistakes or compensating an individual or a family because an error occurred.

Senator Moore described a health care technology bond that has been proposed in Massachusetts (SB 552). “It would provide zero-interest loans to community hospitals and neighborhood health centers to help them get the money up front to institute these systems.” Repayments would be made with money saved. Dr. Lawrence agreed that in the long run, error reduction pays for itself. “I think the data centers have to be looked at as a cost management system, rather than an additional cost, if they are going to be successful and funded at an adequate level.”

**Conclusion**

Recent reports such as the Institute of Medicine’s “To Err Is Human: Building a Safer Health System” illustrate the effect of medical errors on the general public and spur policy makers to use their governing authority to initiate reforms. While the issue of reporting remains contentious, states are attempting to come to terms with how to balance the need for information and timely reporting of errors with the liability fears of health care professionals. Technological advances such as electronic transfer of prescriptions and other testing and monitoring procedures have proven successful in decreasing both the number of errors and the costs associated with these errors.

Purchasers need to be aware of the role they play in health care safety by considering the quality of service as well as cost when making provider decisions. Mandatory staffing remains an issue, especially as shortages persist and states are faced with the difficulty of attracting new workers to the health care industry. Legislators may find success applying strategies used to increase the number of professionals going into other fields that have experienced similar problems, including increased scholarships and student loan forgiveness. While errors remain a significant problem, examples from other industries as well as programs and legislation already in place indicate solutions exist and that health care can be made safer for everyone.

2 ibid.
3 ibid.
5 “Reducing and Preventing Adverse Drug Events to Decrease Hospital Costs,” Agency for Healthcare Research and Quality (2001).
7 http://www.ahrq.gov/qual/newgrant/working.htm