

Improve patient safety and reduce medical errors

Patient safety problems

Typically, medicine has viewed errors as failing. Fault-free performance is expected from the clinician; mistakes are unacceptable. When error occurs, there is sometimes 'naming, blaming, shaming, and training' of the individual.

Considering the complex nature of medical practice, however, and the multitude of interventions that each patient receives, a high error rate in medicine is perhaps not surprising. Health care professionals such as physicians, nurses, and pharmacists are trained to be careful and to function at a high level of efficiency. Notwithstanding, if a system is working at 99.9% efficiency, the 0.1% error rate remains unsatisfactory.

The following staggering statistics were estimated in 1987:

"If we had to live with 99.9% efficiency, we would have in USA: 2 unsafe plane landings per day at O'Hare, Chicago, 16 000 pieces of lost mail every hour, 32 000 bank checks deducted from the wrong bank account every hour."¹

Similarly, let us assume in an acute hospital with 1000 in-patients, each patient on average would have four drugs prescribed, administered 3 times a day. This would mean more than 4 000 000 doses administered per year. Consider the various possible error rates:

- (1) A 1% error rate would equate to 40 000 errors;
- (2) A 0.5% error rate would equate to 20 000 errors; and
- (3) A 0.1% error rate would equate to 4000 errors per year.

Assuming at the 0.1% error rate that 0.1% of these errors would lead to serious consequences, then there would be four serious injuries per year due to drug errors. Would these errors be acceptable to the public? How can we achieve the goal of a fail-safe system that is free of errors? Would perfecting the skill of the clinician improve the situation? How frequently do errors occur in our health care system?

Studies on adverse events in hospitalised patients indicate an even greater problem. In 1991, the Harvard Medical Practice study reported the results of a population-based study of iatrogenic injury in patients hospitalised in New York in 1984. The study found that 3.7% of patients suffered an injury that prolonged their hospital stay or resulted in measurable disability. For New York, this equated to a total of 98 609 patients in 1984. Of these injuries, 13.6% were fatal. "If the error rates are typical of the US, then 180 000 people die each year partly as a result of iatrogenic injury, the equivalent of three jumbo-jet crashes every 2 days."²

The findings of the Harvard Medical Practice study have been corroborated by studies of adverse events in Colorado

and Utah in 1992.²⁻⁵ These two large studies found that adverse events occurred in 2.9% and 3.7% of hospitalised patients, respectively. In Colorado and Utah hospitals, 8.8% of adverse events led to death, as compared with 13.6% in New York hospitals. Both studies also indicated that over half of these adverse events resulted from medical errors that could be prevented (53% in Colorado and Utah and 58% in New York). The Institute of Medicine (IOM) November 1999 report⁶ also focused a great deal of attention on the issue of medical errors and patient safety. The report estimated that as many as 44 000 to 98 000 people die in hospitals each year as a result of medical errors.

This data is truly shocking. Even using the lowest estimate, this would make medical errors the eighth leading cause of death in the US—higher than motor vehicle accidents, breast cancer, or AIDS. Approximately 7000 people per year are estimated to die from medication errors alone—about 16% more deaths than the number attributable to work-related injuries. The report estimates that medical errors cost the US approximately \$37.6 billion each year. The costs associated with preventable errors are estimated to be between US\$17 and \$29 billion.

In the UK, figures released by the Department of Health report that adverse events occur in approximately 10% of admissions and cost £2 billion per year in hospital stays. Medical error is considered the third most frequent cause of death in Britain after cancer and heart disease.^{7,8} In Australia, it has been reported that more than 5500 Australians died over a 2-year period through complications, errors, and drug reactions, as a result of hospital care.⁹

Why is the error rate in the practice of medicine so high? Leape¹ from the Harvard School of Public Health argues that it is due to lack of awareness of the severity of the problem. The health care system has not made safety a high priority. Hospital-acquired injuries are not reported in the newspapers like jumbo-jet crashes. Although error rates are substantial, serious injuries due to errors are not part of the everyday experience of physicians or nurses, and are perceived as isolated and unusual events. In addition, most errors, eg mistreated urinary tract infections, do little or no harm.

Public perspective

The IOM report shocked the public and undermined their fundamental trust in the health care system. The National Patient Safety Foundation conducted a public opinion survey and presented the results at a media briefing entitled 'Finding cures for medical error' in New York.¹⁰ The featured findings were that 42% of respondents had been affected by medical error, either personally or through a friend or relative. Among

the mistakes recalled were misdiagnosis (40%), medication errors (28%), and mistakes during a procedure (22%). Thirty-two percent of the respondents indicated that the error had a permanent negative effect on health. A second survey, conducted by the American Society of Health System Pharmacists, found that Americans were 'very concerned' about being given the wrong medicine (61%), being given two or more medicines that interact in a negative way (58%), and complications from a medical procedure (56%).¹¹ More than half of the survey respondents ascribed these errors to carelessness, improper training, or poor communication. When asked about the possible solutions to medical errors, 75% thought it would be most effective to keep health professionals with 'bad track records' from providing care. Sixty-nine percent thought the problem could be solved through better training of health professionals. The idea of patient safety seemed to be new to many respondents. When asked "What comes to mind when you think about patient safety issues in the health care environment?", 8% answered "nothing", 13% said "the general level of care", and 11% answered "the qualifications of health care professionals".

Patient safety strategy

The IOM report prompted a number of legislative and regulatory initiatives designed to document errors and to search for solutions. At the governmental level, the US government recently established the Patient Safety Task Force within the Department of Health and Human Services. The task force will coordinate a joint effort between several agencies to improve existing systems for collecting data on patient safety. This new task force is also charged with implementing a 'user-friendly internet-based patient safety reporting format' to facilitate a more rapid response to safety problems. Similarly, the UK government recently established a National Patient Safety Agency, which will establish nationally coordinated reporting systems, help investigate errors, and disseminate lessons learned. A draft consultation document is currently available at the UK Department of Health website.¹²

An interesting recent publication produced by the US Patient Safety Task Force through its agency for health care research and quality is entitled 'Making health care safer: a critical analysis of patient safety practices'. This report uses an evidence-based approach to assessing the effectiveness of patient safety practices.¹³

The US hospital accreditation body, the Joint Commission on Accreditation of Healthcare Organizations, has conducted a regular review of sentinel events reported by health care organisations since 1995 (Table).¹⁴ The health care organisations were required to do 'root-cause' analysis, with identification of improvement strategies to reduce risk. The Joint Commission publishes the 'Sentinel Event Alert' to share the most important lessons learned and to provide data relating to the occurrence and management

Table. Joint Commission on Accreditation of Healthcare Organizations (US): Review of sentinel events (January 1995 to October 2001)

Type of sentinel event	No. (%)
Patient suicide	242 (17.3)
Operative/postoperative complications	168 (12.0)
Medication error	162 (11.6)
Wrong-site surgery	148 (10.6)
Delay in treatment	73 (5.2)
Patient death/injury in restraints	69 (4.9)
Patient falls	67 (4.8)
Assault/rape/homicide	60 (4.3)
Perinatal death/loss of function	36 (2.6)
Transfusion error	35 (2.5)
Patient elopement	31 (2.2)
Fire	29 (2.1)
Ventilator death/injury	23 (1.6)
Infant abduction/wrong family	23 (1.6)
Anaesthesia-related event	20 (1.4)
Medical equipment-related event	19 (1.4)
Maternal death	18 (1.3)
Death associated with transfer	14 (1.0)
Other less frequent types	161 (11.5)

of sentinel events in health care.¹⁵ The Joint Commission has also recently developed new patient safety standards for hospitals to follow. Thus, hospitals in the US are required to have a patient safety programme in place, good examples of which are reported on the World Wide Web.^{16,17}

Other bodies have also made initiatives to promote patient safety. For example, the US National Patient Safety Foundation provides a wealth of patient safety resources and organises 'Error conferences'. Similarly, the Australian Patient Safety Foundation provides the Australian Incident Management System for voluntary and anonymous reporting of errors.

In Hong Kong, the Hospital Authority is also placing a stronger emphasis on patient safety and has recently formulated a risk management policy and strategy, as well as forming working groups to address this concern. All private hospitals are also active in accreditation activities to improve the quality of care.

Approaches to reduce errors

Leape¹ has argued that the health care system is 'locked into' an ineffective paradigm for preventing errors, in that it relies entirely on professional training and standards, which are enforced by punishment for lapses. This punitive approach to errors provides a strong incentive for health care workers not to report their mistakes or those of colleagues.

Concealing these errors robs clinicians and others from investigation of the underlying causes and making the necessary changes to prevent recurrence. Leape has suggested that creating 'a non-punitive' environment is the first step to becoming a 'high reliability' organisation. A second step is to focus on system design. Most errors result from faulty systems—poorly designed processes that 'set people up' to make mistakes by putting them in situations where errors are more likely to be made.

It is apparent that the most fundamental change that will be needed in error reduction is a cultural 'shift' towards patient safety. Physicians and nurses need to accept the notion that error is an inevitable accompaniment of the human condition, even among conscientious professionals with high standards. Errors must be accepted as evidence of systems flaws not character flaws. No treatment is risk free, but safety should at least be recognised as the first dimension of quality. The US Department of Veterans Affairs describe patient safety as:

"A combination of three things: state of mind, or mind-set, a set of processes, and an outcome. The mind-set must come from recognizing that modern health care is a very complex and high-risk activity; every person, process, and activity has flaws or weakness that can potentially compromise patient well being; and solutions to problems are found improving the system of care. The process include reporting, investigation, evaluating and analyzing, eliminating or reducing hazards, and continuous improvement; while the outcomes are fewer medical errors, less treatment-related morbidity and mortality, and minimized risk or hazard."¹⁷

This calls for continuous assessment of patient treatment, acknowledgement of errors when they occur, open and complete reporting of adverse events, system redesign based on analysis of these events, and rapid dissemination of lessons learned.

Conclusion

Clinicians should have a broader understanding of patient safety problems, their causes, the consequences for health care quality and cost, and how such errors occur in the delivery of health care. Improving patient safety is a team effort—most medical errors cannot be prevented by attempts to perfect the skill-level of individual doctors. Patient safety often involves the coordinated efforts of multiple members of the health care team, as well as adopting strategies from outside the health care system, such as those used in the aviation and nuclear power industries. In promoting awareness of medication safety, patients and carers should also be helped to avoid errors in taking medicines.

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