Improving safety and quality: how can education help?

Merrilyn M Walton and Susan L Elliott

ABSTRACT

- National efforts to improve the quality and safety of health care present challenges for medical education and training.
- Today's doctors need to be skilled communicators who know how to identify, prevent and manage adverse events and near misses, how to use evidence and information, how to work safely in a team, how to practise ethically, and how to be workplace teachers and learners.
- These competencies (knowledge, skills and attitudes) are set out in the National Patient Safety Education Framework (NPSF) of the Australian Council for Safety and Quality in Health Care.
- The NPSF is designed to help medical schools, vocational colleges, health organisations and private practitioners develop curricula to enable health professionals to work safely.
- The NPSF describes what doctors (depending on their level of knowledge and experience) can do to demonstrate competencies in a range of quality and safety activities.
- Medical schools, vocational colleges, health organisations and private practitioners need to work collaboratively with one another and with other health professionals to ensure that patient safety and quality curricula are implemented and evaluated, and that valid and reliable assessments of learning outcomes are developed.
- Interdisciplinary and vertically integrated education and training are needed, incorporating innovative methods, to create a safer health care system.

MJA 2006; 184: S60–S64

As the national spotlight turns on the safety and quality of health care, there is intense scrutiny of adverse events, professional accountability and multidisciplinary teamwork. Improving safety and quality of health care requires competent health professionals who deliver patient-centred care as members of interdisciplinary teams, and use evidence-based and ethical practice, quality improvement approaches and information technology (IT). These health professionals know about organisational complexity, systems theory, human factors, professionalism, error recognition, management and prevention.

Many of these concepts are new to medical education. In 2003, the US Institute of Medicine report *Health professions education: a bridge to quality* argued strongly for the education of health professionals in patient safety.[1] The report identified five core competencies deemed essential for health professionals: the capacity to provide patient-centred care, to work in interdisciplinary teams, to employ evidence-based practice, to apply quality improvement methods and to utilise informatics.

Why is it necessary to educate doctors about quality and safety?

Demands for change in medical education are no longer confined to the medical profession; governments and the community also want change as a result of publicised adverse events. Retrospective medical record reviews in the United States, United Kingdom, Denmark, New Zealand, Canada and Australia have revealed the extent of injury to patients as a result of their health care.[2-8] Most medical educators acknowledge that problems are caused by poorly designed systems, but are uncertain what needs to be taught about quality and safety, and how best to teach and assess it. More than a decade ago, Leape alerted the profession to the role of systems in adverse events,[9] but the practical application of systems theory remains undeveloped.

Systems theory is an interdisciplinary field which studies systems as a whole, focusing on complexity and interdependence. Systems theorists argue that errors are more often caused by pre-existing organisational factors (eg, poor processes, poor designs, poor teamwork, financial constraints and institutional factors) than by human blunders or negligence. Health professionals are not routinely trained in systems language and concepts, nor do they use relevant tools to make sense of their workplace.[10] Although many clinicians recognise the problems in the system of health care delivery they do not know how to address them at the institutional or at the individual practice level.

The Productivity Commission report on the health workforce moved the supply of workforce and the environment in which doctors work and learn to centre stage.[11] Education and training were also emphasised by the National Health Workforce Strategic Framework, in which ensuring an appropriately skilled and competent workforce was one of seven action areas agreed on by health ministers in 2005[12] (Box 1).

How and where should doctors learn?

Education of clinicians about quality and safety is best undertaken in the workplace, not in lecture theatres. When training and education of health care workers is divorced from patients and the places they are treated (hospital, clinic, office or the home), key learning areas such as complexity of care, communication, teamwork and patient engagement lose context and relevance.

Innovative workplace learning is designed around the learner's level and needs, valid assessment methods and the use of local resources. Although education based on competency and performance is becoming more common, much education and training is still structure- and process-based. Despite an apparent consensus that educational programs about safety need to move from didactic lecture style formats[13] to competency-based education, there remains a lack of shared understanding of what a competency is, and how it can be demonstrated.[14]

We need to adopt a range of innovative teaching and assessment strategies, and not just rely on traditional expert clinicians imparting their knowledge and skills at the bed- or chair-side or in lecture theatres.

1 National Health Workforce Strategic Framework: key action areas[12]

The Framework summarised seven key action areas:

- ensuring and sustaining health workforce supply;
- workforce distribution that optimises access to health care and meets the health needs of all Australians;
- ensuring health organisations are places in which people want to work;
- ensuring the health workforce is always skilled and competent;
- optimal use of skills and workforce adaptability;
- recognising that health workforce policy and planning must be informed by the best available evidence and linked to the broader health system; and
- recognising that health workforce policy involves all stakeholders working collaboratively. ◆

Available strategies for learning, teaching and assessment include case studies, role plays, professional mentoring, simulation (low and high fidelity), hypothetical scenarios, seminars, videos, films, project work, log books, interprofessional activities, teaching by patients (real, standardised or simulated) and carers, peer review and objective structured clinical examinations (OSCEs).

The patient's role in medical education has been relatively passive. Yet patients are a valuable potential resource; they could be involved in discussion groups, problem-based learning groups, simulations and interactive seminars on topics such as management of chronic diseases, risk communication, health education and adverse events. Patients are increasingly involved in the assessment of communication skills and could also be used in assessing risk communication.

What should happen?

Quality and safety training and education, having arrived, are yet to be successfully incorporated into Australian undergraduate and postgraduate medical training. A major barrier has been the lack of an educational framework describing what health professionals need to know about patient safety.

The National Patient Safety Education Framework

In 2005, the Australian Council for Safety and Quality in Health Care published the National Patient Safety Education Framework (NPSF).[15] The NPSF identifies the competencies that health care workers need to deliver safe health care (Box 2). It is designed to help medical schools, vocational colleges, health organisations (private and public hospitals, nursing homes and community health centres) and private practices to develop curricula and training programs for students, trainees and staff. The NPSF recognises that all health workers, not only doctors, are responsible for patient safety. As adverse events and poor quality are known to correlate with poorly designed systems and inadequate communication, the NPSF was designed to apply to everyone working within the health system, not just health professionals.

The learning areas and topics of the NPSF were developed from the literature,[16] and validated by national and international experts and information gathered from wide consultation with health professionals, managers and consumers across Australia. Each topic is accompanied by a set of competencies (knowledge, skills and behaviours) relevant to one's level of responsibility for patient care.

Communication

A consistent theme in publications on quality and safety is the importance of clear, accurate and timely communication among clinicians, patients, carers and management. The link between mistakes and inadequate communication (ie, inadequate, wrong or no communication) is firmly established.[17-19] Treatment outcomes are also influenced by how well clinicians communicate with their patients and other health care workers.[20-22] How do doctors engage with their patients? What is the best way to convey risk information? What steps must a doctor take to provide complete information after adverse events? How do doctors show respect for cultural differences? A competent doctor would demonstrate these competencies relative to their level of knowledge and experience.

Teaching communication skills is now firmly embedded within undergraduate programs, but a greater challenge is learning how to communicate in complex environments where multiple people are involved in the care of each patient. Simulator centres are used for training and assessment of team communication in emergency scenarios. However, there has been little attention to less acute settings, although regional general practitioner training programs are beginning to address these issues in primary care.

Identifying, preventing and managing adverse events and near misses

Adverse events occur across the health system. Most health organisations have, or are implementing, methods for reporting and analysing serious adverse events.[23] Doctors need to recognise errors and system failures, understand the underlying factors, and know how to make the necessary improvements to prevent them recurring. The common use of the word "stuff-up" to describe a mistake or error suggests inadequate preparation and knowledge, and an inappropriate focus on the individual rather than the system. Research shows that an understanding of the nature of errors and application of quality improvement concepts reduces errors, waste and inefficiency.[24,25]

Using evidence and information

The constantly changing clinical environment requires doctors to regularly update their knowledge and skills. They can no longer rely on prior learning;[26] they need to know how to formulate relevant clinical questions, how to efficiently find the best evidence, and how to incorporate the findings into practice.[27] Many medical courses have addressed the need for graduates to have the skills required for evidence-based decision-making and lifelong learning.

Health informatics refers to the systematic application of computer science and technology to health practice, health care services, research and education.[28] Evidence suggests that routine use of information and communication technology improves patient care.[29] However, many clinicians are unaware of the developments in informatics and their potential role in patient safety. Come the genomic era, doctors will require skills and knowledge about new technologies and computer-generated tests, such as genetic testing. They will be expected to understand clinical informatics and how IT can reduce errors in the workplace. They will use IT tools to measure performance and to

2 National Patient Safety Education Framework: learning areas and topics[15]

1. Communicating effectively
1.1 Involving patients and carers as partners in health care
1.2 Communicating risk
1.3 Communicating honestly with patients after an adverse event (open disclosure)
1.4 Obtaining consent
1.5 Being culturally respectful and knowledgeable

2. Identifying, preventing and managing adverse events and near misses
2.1 Recognising, reporting and managing adverse events and near misses
2.2 Managing risk
2.3 Understanding health care errors
2.4 Managing complaints

3. Using evidence and information
3.1 Employing best available evidence-based practice
3.2 Using information technology to enhance safety

4. Working safely
4.1 Being a team player and showing leadership
4.2 Understanding human factors
4.3 Understanding complex organisations
4.4 Providing continuity of care
4.5 Managing fatigue and stress

5. Being ethical
5.1 Maintaining fitness to work or practise
5.2 Ethical behaviour and practice

6. Continuing learning
6.1 Being a workplace learner
6.2 Being a workplace teacher

7. Specific issues
7.1 Preventing wrong site, wrong procedure and wrong patient treatment
7.2 Medicating safely ◆

identify, access and interpret online health-related information and data.

Working safely as a team

Another common theme in quality and safety publications is the role of the multidisciplinary team in improving quality and continuity of care. Communicating accurate information in a timely way to the right people can be complex and difficult because of the spread of clinical responsibility among members of the health care team.[19,30] Hospital doctors may identify others within the hospital-based medical team but may be less familiar with other teams responsible for patients, such as GP- and community-based teams. Effective health care teams communicate with one another and combine their observations, expertise and decision-making to optimise patient care.[1]

Effective teamwork is known to reduce errors caused by miscommunication, poor handover, and delayed diagnosis and treatment, particularly for those with a chronic illness.[31-33] Yet, the role of effective teamwork in reducing risks and improving continuity of care may not be readily appreciated by clinicians, as they are trained to accept individual responsibility. Nor is the role of human factors in reducing errors fully understood; otherwise, checklists and use of protocols would be the rule rather than the exception. Junior doctors are particularly vulnerable to errors during handover on rostered nights and over weekends, yet no particular training occurs to improve patient safety. The State Postgraduate Medical Councils have collaborated on producing a national curriculum for pre-vocational training, which includes safety and quality as a learning area, and will be available for consultation later this year. Knowledge about organisational complexity and the different professional and organisational cultures is critical for understanding the influence of the environment and poorly designed systems on quality of care. This, too, is poorly understood; otherwise, multidisciplinary morbidity and mortality meetings, handovers and clinical review meetings would be common. They are not.

Ethical practice

Medical ethics, clinical ethics and ethical practice are now receiving greater attention in education and training because of the increased use of technology, the range of care and treatment options, and greater demands for accountability by the public and professional registration authorities. State Medical Boards, the Colleges and accrediting bodies, such as the Australian Medical Council, stress the importance of professionalism and its role in maintaining community trust. The NPSF identifies ethical and professional practice as a key area in patient safety. Reason argues that a systems approach to error management necessarily incorporates strong professional regulation.[34] The perceived contest between individuals and bad systems as the cause of patient injuries temporarily confused many clinicians and managers, but individuals have always remained accountable when they act unprofessionally.

Two learning topics describe the competencies for clinicians in relation to "fitness to practise" and "professional and ethical behaviour". Junior doctors, for example, are expected to practise at the standards required by their medical registration board and set by their professional body. They would be expected to know how to report unsafe, incompetent and unethical coworkers and unsafe work situations, and know how to maintain their knowledge and skills. They would also provide a good standard of service, work within their knowledge limits, keep up-to-date with laws and regulations, willingly consult coworkers, participate in clinical audits, and delegate and report appropriately.

Professionalism is now a priority standard for most health professions. The term covers the attitudes and behaviours that promote and maintain the patient's best interests above and beyond all other considerations. An ethical health professional (irrespective of their position) would put patients' interests above their own, avoid harm, respect patient autonomy, maintain competence, and work and practise within the bounds of their knowledge and experience.

Health registration boards, health departments, hospitals and other health services are increasingly providing guidance to clinicians on the importance of professionalism. Most Australian medical faculties have professionalism as a key teaching and learning domain, with innovative approaches to assessment, including peer feedback and reflective portfolios.

Continuing teaching and learning

Teaching is a long recognised responsibility of clinicians, but the infrastructure to support clinician teaching is inadequate. Passing on skills and knowledge to the next generation was once relatively easy, with greater patient access and time for small-group tutorials, but today clinicians are finding teaching difficult. Many have received little training in educational methods, and their teaching activities are often an add-on to other duties. New innovative methods, such as ambulatory teaching clinics, are urgently required to support clinical teaching.

The organisation of health services and high workload in hospitals and private practice, coupled with rapid changes to health information, make it impossible for individuals to keep up-to-date using the traditional methods of reading journals or attending lectures and conferences. New competencies in workplace learning are required. Working in health care is a lifelong journey that requires the application of self-directed learning, self-monitoring and self-assessment techniques, coupled with peer validation.

How should medical educators and trainers use the NPSF?

The NPSF offers a unique opportunity for collaboration among the various health and medical educational organisations. The Committee of Deans of Australian Medical Schools (CDAMS) was involved in developing patient safety education and its continued advocacy and leadership is essential. The NPSF greatly facilitates the development of patient safety education modules that address the learners' needs. Modular development permits integration into existing undergraduate and postgraduate curricula, but incorporating new content and activities requires an effective local "champion", a collective commitment to reducing time allocated to pre-existing content, and the implementation of meaningful assessment. The absence of these elements has wasted the hard work and expertise of several previous discipline-specific national curriculum development teams.

Adding another course to existing curricula is not practical or desirable. In an already overcrowded curriculum, patient safety should not be taught as a separate subject, but integrated as a theme into all existing coursework. For undergraduate medical courses, the accreditation role of the Australian Medical Council should be exploited to ensure all schools incorporate the NPSF goals. CDAMS and the vocational colleges are well placed to help medical educators and clinicians build capacity by sponsoring and evaluating workshops that prepare academic and clinical staff to incorporate safety and quality into training and education programs.

The methods for optimal learning depend on the topic and the knowledge and skills required. A variety of teaching and assessment methods could be used to help undergraduates and graduates learn about patient safety. As the NPSF is outcome-focused, students and clinicians will need to demonstrate their performance in a number of key activities for each of the learning topics.

Conclusion

The NPSF has far-reaching implications for professional colleges, universities, registered training organisations, and workplace education and training programs. The Framework supports education and training in all environments and does not rely solely on the traditional professional groups or teaching methods for implementation. The future learning environment is one in which different health professions will work and learn together using locally relevant and innovative teaching methods.

Unless we provide the right learning environment and education and training on quality and safety, our response to legitimate concerns from the public will continue to be ad hoc and ineffective. It is time for medical schools, colleges, health organisations and private practices to work collaboratively. Opportunities for interdisciplinary and vertically integrated education and training need to be realised, and new paradigms employed to create a safer health care system in which effective teams make evidence-based decisions in the best interests of their patients.

Competing interests

Dr Merrilyn Walton was the Director of the National Patient Safety Education Framework project and the author of the Framework.

Author details

Merrilyn M Walton, PhD, Associate Professor of Ethical Practice[1]
Susan L Elliott, MD, FRACP, Assistant Vice-Chancellor (Teaching, Learning and Equity)[2]
1 Office of Teaching and Learning in Medicine, Faculty of Medicine, University of Sydney, Sydney, NSW.
2 University of Melbourne, Melbourne, VIC.
Correspondence: mwalton@med.usyd.edu.au

References

1 Institute of Medicine. Health professions education: a bridge to quality. Washington DC: National Academies Press, 2003.
2 Davis P, Lay-Yee R, Briant R, et al. Adverse events in New Zealand public hospitals: principal findings from a national survey. Wellington: New Zealand Ministry of Health, 2001. Occasional Paper 3.
3 Brennan TA, Leape LL, Laird N, et al. Incidence of adverse events and negligence in hospitalized patients: results of the Harvard Medical Practice Study I. *N Engl J Med* 1991; 324: 370-376.
4 Leape L, Brennan T, Laird N, et al. The nature of adverse events in hospitalized patients: results of the Harvard Medical Practice Study II. *N Engl J Med* 1991; 324: 377-384.
5 Wilson RM, Runciman WB, Gibberd RW, et al. The Quality in Australian Health Care Study. *Med J Aust* 1995; 163: 458-471.
6 Gawande AA, Thomas EJ, Zinner MJ, Brennan TA. The incidence and nature of surgical adverse events in Colorado and Utah in 1992. *Surgery* 1999; 126: 66-75.
7 Secker-Walker J, Taylor-Adams S. Clinical incident reporting. In: Vincent C, editor. Clinical risk management. London: BMJ Books, 2001: 422.
8 Baker GR, Norton PG, Flintoft V, et al. The Canadian Adverse Events Study: the incidence of adverse events among hospital patients in Canada. *CMAJ* 2004; 170: 1678-1686.
9 Leape LL. Error in medicine. *JAMA* 1994; 272: 1851-1857.
10 Weick KE. The reduction of medical errors through mindful interdependence. In: Rosenthal M, Sutcliffe K, editors. Medical error. What do we know? What do we do? San Francisco: Jossey-Bass, 2002.
11 Woods M, Fitzgerald R. Australia's Health Workforce. Productivity Commission research report. Canberra: Commonwealth of Australia, 2005. Available at: http://www.pc.gov.au/study/healthworkforce/finalreport/ (accessed Feb 2006).
12 Australian Health Ministers' Conference. National Health Workforce Strategic Framework. Sydney: National Health Workforce Secretariat, 2004.
13 Wass V, Van der Vleuten C, Shatzer J, Jones R. Assessment of clinical competence. *Lancet* 2001; 357: 945-949.
14 Carraccio C, Wolfsthal SD, Englander R, et al. Shifting paradigms: from Flexner to competencies. *Acad Med* 2002; 77: 361-367.
15 The Australian Council for Safety and Quality in Health Care. National Patient Safety Education Framework. Canberra: Commonwealth of Aus-

tralia, 2005. Available at: http://www.safetyandquality.org/framework0705.pdf (accessed Feb 2006).
16 Lyons P, Walton M, Australian Council for Safety and Quality in Health Care. National Patient Safety Education Framework bibliography. Canberra: Commonwealth of Australia, 2005. Available at: http://www.safetyandquality.org/framewkbibli0705.pdf (accessed Apr 2006).
17 Waterhouse JD, Folkard S, Minors D. Shiftwork, health and safety: an overview of the scientific literature 1978-1990. Research Report No: 31/1992. London, UK: HMSO,1992.
18 Charles C, Gafni A, Whelan T. Shared decision-making in the medical encounter: what does it mean? (or it takes at least two to tango). *Soc Sci Med* 1997; 44: 681-692.
19 Chassin MR, Becher EC. The wrong patient. *Ann Intern Med* 2002; 136: 826-833.
20 Coiera EW, Tombs V. Communication behaviours in a hospital setting: an observational study. *BMJ* 1998; 316: 673-676.
21 Lingard L, Reznick R, Espin S, et al. Team communications in the operating room: talk patterns, sites of tension, and implications for novices. *Acad Med* 2002; 77: 232-237.
22 Gosbee J. Communication among health professionals. *BMJ* 1998; 316: 642.
23 Australian Council for Safety and Quality in Health Care, National Institute of Clinical Studies. Charting the safety and quality of health care in Australia. Canberra: Commonwealth of Australia, 2004.
24 Holman WL, Allman RM, Sansom M, et al. Alabama coronary artery bypass grafting project: results of a statewide quality improvement initiative. *JAMA* 2001; 285: 3003-3010.
25 O' Connor GT, Plume SK, Olmstead EM, et al. A regional intervention to improve the hospital mortality associated with coronary artery bypass graft surgery. The Northern New England Cardiovascular Disease Study Group. *JAMA* 1996; 275: 841-846.
26 Institute of Medicine. Patient-centered care and the chronically ill: what does the future hold? Health Cast. Washington DC: Henry Kaiser Family Foundation, 2002. Available at: http://www.kaisernetwork.org (accessed Oct 2004).
27 Grad R, Macaulay AC, Warner M. Teaching evidence-based medical care: description and evaluation. *Fam Med* 2001; 33: 602-606.
28 Northwest Center for Public Health Practice. Public health Informatics competencies. Seattle: University of Washington, 2002.
29 Institute of Medicine. Crossing the quality chasm: a new health system for the 21st century. Washington DC: National Academy Press, 2001.
30 Gerteis M, Edgman-Levitan S, Daley J, Delbanco TL, editors. Through the patient's eyes: understanding and promoting patient-centred care. San Francisco: Jossey-Bass, 1993.
31 Wagner EH. The role of patient care teams in chronic disease management. *BMJ* 2000; 320: 569-572.
32 Silver MP, Antonow JA. Reducing medication errors in hospitals: a peer review organization collaboration. *Jt Comm J Qual Improv* 2000; 26: 332-340.
33 Weeks WB, Mills PD, Dittus RS, et al. Using an improvement model to reduce adverse drug events in VA facilities. *Jt Comm J Qual Improv* 2001; 27: 243-254.
34 Reason JT. Managing the risks of organisational accidents. Aldershot, UK: Ashgate Publishing, 1997.

(Received 30 Nov 2005, accepted 15 Feb 2006) ❑