WHO Patient Safety Curriculum Guide for Medical Schools
1. Background

**Why do medical students need patient safety education?**

Health care outcomes have significantly improved with the scientific discoveries of modern medicine. However, studies from a multitude of countries show that with these benefits come significant risks to patient safety. We have learnt that hospitalized patients are at risk of suffering an adverse event, and patients on medication have the risk of medication errors and adverse reactions. A major consequence of this knowledge has been the development of patient safety as a specialized discipline. Clinicians, managers, health-care organizations, governments (worldwide) and consumers must become familiar with patient safety concepts and principles. Everyone is affected. The tasks ahead of health care are immense and require all those involved care to understand the extent of harm to patients and why health care must move to adopt a safety culture. Patient safety education and training is only beginning to occur at all levels. Medical students, as future doctors and health-care leaders, must also be prepared to practise safe health care. Though medical curricula are continually changing to accommodate the latest discoveries and new knowledge, patient safety knowledge is different from other because it applies to all areas of practice.

Medical students, as future clinicians, will need to know how systems impact on the quality and safety of health care, how poor communication can lead to adverse events and much more. Students need to learn how to manage these challenges. Patient safety is not a traditional stand alone discipline; rather, it is one that integrates into all areas of medicine and health care. The World Health Organization’s (WHO) World Alliance for Patient Safety, and other projects such as this one, aims to implement patient safety worldwide. Patient safety is everyone’s business, all the way from patients to politicians. As medical students are among the future leaders in health care, it is vital that they are knowledgeable and skilful in their application of patient safety principles and concepts. The WHO Patient Safety Curriculum Guide for Medical Schools sets the stage for medical students to begin to practise patient safety in all their clinical activities.

Building students’ patient safety knowledge needs to occur throughout medical school. Patient safety skills and behaviours should begin as soon as the students enter a hospital, clinic or health service. By getting students to focus on each individual patient, having them treat each patient as the unique human being they are and using their knowledge and skills carefully students themselves can be role models for others in the health-care system. Most medical students have high aspirations when they enter medicine, but the reality of the system of health care sometimes deflates their optimism. We want students to be able to maintain their optimism and believe that they can make a difference, both to the individual lives of patients and the health-care system.

**What is the Curriculum Guide?**

The Curriculum Guide is a comprehensive programme for implementation of patient safety education in medical schools worldwide. It comprises two parts. Part A is a teacher’s guide, which has been designed to assist teachers to implement the Curriculum Guide. We are aware that patient safety is a new discipline and many clinicians and faculty staff are unfamiliar with many of the concepts and principles. This lays the foundations for capacity-building in patient safety education and Part B provides a comprehensive, ready-to-teach, topic-based patient safety programme that can be implemented either as a whole or on a per topic basis.
Why was the Curriculum Guide developed?

Since the Harvard study [1] in 1991 first described the extent of harm to patients, other countries have found similar results, notwithstanding the differences in their cultures and health systems. The realization that health care actually harms patients has increased scrutiny of patient care in the context of an increasingly complex health system. This complexity has been intensified by rapidly changing medical technology and service demands [2,3]. Doctors, nurses and allied health-care workers are expected to work while managing this complexity, provide evidence-based health-care services and keep patients safe. However, unless they are properly educated and trained in patient safety concepts and principles they will struggle to do this.

Patient safety education for health professionals in the higher education sector has not kept up with workforce requirements [3-7]. Reporting of specific curricula on medical error or patient safety courses in undergraduate medical education has only recently started to gain ground in the published literature [5,8]. The need for patient safety education of medical clinicians was confirmed by a study of a multi-institutional assessment of patient safety knowledge among 693 medical trainees [9]. This study found that knowledge levels of patient safety across a broad band of training, degrees and specialities were substantially limited, and that trainees were unable to self-assess their own knowledge deficiencies in patient safety.

A number of factors have impeded patient safety education. First, the lack of recognition by medical educators that teaching and learning patient safety is an essential part of the undergraduate medical curriculum, and that patient safety skills can be taught [10,12]. Being a new area, many medical educators are unfamiliar with the literature are unsure how to integrate patient safety learning into existing curriculum. [11-13] Second, educators need to be open to new areas of knowledge [3]. One of the difficulties in introducing new curricula is a reluctance to address knowledge that originates from outside medicine such as systems thinking and quality improvement methods [12]. It has also been suggested that the historical emphasis on treatment of disease rather than prevention of illness creates a culture that finds it difficult to give merit to a “non-event”, that is, an adverse event that is preventable [3]. A third factor relates to entrenched attitudes regarding the traditional teacher–student relationship—one that may be hierarchical and competitive [10] and where an “expert” disseminates information to the student [3,4].

In 2007, the Association for Medical Education in Europe [10] called for patient safety education to be integrated throughout the undergraduate course, including the first year, when awareness of the nature and the extent of threats to patient safety can be raised and generic skills can be developed. This Curriculum Guide seeks to fill the gap in patient safety education by providing a comprehensive curriculum designed to build foundation knowledge and skills for medical students that will better prepare them for clinical practice in a range of environments.
1.背景

参考文献
2. How were the Curriculum Guide topics selected?

The Curriculum Guide covers 11 topics, including 16 of a total of 22 learning topics that were included in the evidence-based Australian Patient Safety Education Framework (APSEF).* An additional topic not in APSEF was selected to support learning in infection control targeted by the WHO programme to reduce infections through better control. Figure 1 sets out the topics selected for inclusion or exclusion.

What is the Australian Patient Safety Education Framework?[1]

APSEF was developed using a four-stage approach: literature review, development of learning areas and learning topics, classification into learning domains, and conversion into a performance-based format. An extensive consultation and validation process was undertaken in Australia and internationally. Published in 2005, the Framework is a simple, flexible and accessible template describing the knowledge, skills and behaviours that all health-care workers need to ensure safe patient care. The Framework is divided into level of knowledge, skills and behaviours depending on a person’s position and clinical responsibility in an organization. The Framework is designed to assist organizations and people develop educational curricula and training programmes. We have developed the Curriculum Guide using the Framework in terms of content and rationale.

APSEF is freely available and can be accessed online at http://www.health.gov.au/internet/safety/publishing.nsf/Content/C06811AD746228E9CA2571C600835DBB/$File/framework0705.pdf

The accompanying bibliography can also be accessed online at http://www.health.gov.au/internet/safety/publishing.nsf/Content/C06811AD746228E9CA2571C600835DBB/$File/frameworkbibli0705.pdf

Australian Patient Safety Education Framework learning areas and topics

There are 7 learning areas (categories) and 22 learning topics in APSEF. Table 1 sets out the Curriculum Guide topics and the relationship with APSEF.

* The topics left out were ones that we considered would already be covered in a medical school curriculum such as consent, evidenced-based practice and learning and teaching. Information technology was excluded because of the disparity in access to technology among university medical schools and health services.
2. How were the Curriculum Guide topics selected?

Table 1: APSEF plus WHO topics

<table>
<thead>
<tr>
<th>APSEF topic</th>
<th>Included in curriculum</th>
<th>WHO topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communicating effectively</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Involving patients and carers as partners in health care</td>
<td>yes</td>
<td>Topic 8</td>
</tr>
<tr>
<td>Communicating risk</td>
<td>yes</td>
<td>Topic 6</td>
</tr>
<tr>
<td>Communicating honestly with patients after an adverse event (open disclosure)</td>
<td>yes</td>
<td>Topic 8</td>
</tr>
<tr>
<td>Obtaining consent</td>
<td>no</td>
<td>Highly likely already covered</td>
</tr>
<tr>
<td>Being culturally respectful and knowledgeable</td>
<td>yes</td>
<td>Topic 8</td>
</tr>
<tr>
<td>Identifying, preventing and managing adverse events and near misses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recognizing, reporting and managing adverse events and near misses</td>
<td>yes</td>
<td>Topics 6, 7</td>
</tr>
<tr>
<td>Managing risk</td>
<td>yes</td>
<td>Topic 6</td>
</tr>
<tr>
<td>Understanding health-care errors</td>
<td>yes</td>
<td>Topics 1, 5</td>
</tr>
<tr>
<td>Managing complaints</td>
<td>yes</td>
<td>Topics 6, 8</td>
</tr>
<tr>
<td>Using evidence and information</td>
<td>no</td>
<td></td>
</tr>
<tr>
<td>Working safely</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Being a team player and showing leadership</td>
<td>yes</td>
<td>Topic 4</td>
</tr>
<tr>
<td>Understanding human factors</td>
<td>yes</td>
<td>Topic 2</td>
</tr>
<tr>
<td>Understanding complex organizations</td>
<td>yes</td>
<td>Topic 3</td>
</tr>
<tr>
<td>Providing continuity of care</td>
<td>Not directly covered</td>
<td></td>
</tr>
<tr>
<td>Managing fatigue and stress</td>
<td>yes</td>
<td>Topics 2, 6</td>
</tr>
<tr>
<td>Being ethical</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintaining fitness to work or practise</td>
<td>yes</td>
<td>Topic 6</td>
</tr>
<tr>
<td>Ethical behaviour and practice</td>
<td>yes</td>
<td>Topics 1, 6</td>
</tr>
<tr>
<td>Continuing learning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Being a workplace learner</td>
<td>no</td>
<td></td>
</tr>
<tr>
<td>Being a workplace teacher</td>
<td>no</td>
<td></td>
</tr>
<tr>
<td>Specific issues</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preventing wrong site, wrong procedure and wrong patient treatment</td>
<td>yes</td>
<td>Topic 10</td>
</tr>
<tr>
<td>Medicating safely</td>
<td>yes</td>
<td>Topic 11</td>
</tr>
<tr>
<td>Infection control (not part of Australian framework)</td>
<td>yes</td>
<td>Topic 9</td>
</tr>
</tbody>
</table>
There were three main stages in the development of the Framework content and structure:

1. **Initial review of knowledge and development of framework outline.**
2. **Additional searching for content and assignment of knowledge, skills, behaviours and attitudes.**
3. **Development of performance-based format.**

### Stage 1—Review of knowledge and development of framework outline

A search was conducted to identify the current body of knowledge relating to patient safety (as described in the next section). The literature, books, reports, curricula and web sites collected were then reviewed to identify the major activities associated with patient safety that had a positive effect on quality and safety. These activities were then grouped into categories termed learning areas. Each learning area was analysed and further broken down into major subject areas, termed learning topics. See below for details of the literature review process and the Framework content structure.

The rationale for the inclusion of each learning area and topic has been articulated in the body of the Framework and is summarized below.

### Stage 2—Additional searching for content and assignment of knowledge, skills, behaviours and attitudes

Each learning topic formed the basis for a more extensive search, including additional terms such as education, programmes, training, adverse events, errors, mistakes and organization/institution/health facility/health service. All the activities (knowledge, skills, behaviours and attitudes) for each topic were listed until no more activities were forthcoming and the sources exhausted. This list was then culled for duplication, practicality and redundancy. The remaining activities were then categorized into knowledge, skills or behaviours and attitudes.

The final step in this stage was to allocate each activity to the appropriate level corresponding to the degree of responsibility of particular categories of health-care workers for patient safety:

- **Level 1** (Foundation) identifies the knowledge, skills, behaviours and attitudes that every health-care worker needs to have.
- **Level 2** is designed for health-care workers who provide direct clinical care to patients and work under the supervision of, and for those with managerial, supervisory and/or advanced clinical responsibilities.
- **Level 3** is for health-care workers who have managerial or supervisory responsibilities or are senior clinicians with advanced clinical responsibilities.
- **Level 4** (Organizational) identifies the knowledge, skills, behaviours and attitudes required for clinical and administrative leaders with organizational responsibilities. Level 4 is not part of the progressive learning that underpins the first three levels.

The learning areas and topics were endorsed by the Reference Group and Steering Committee. Extensive consultation with the wider health system and community within Australia as well as internationally completed the review and endorsement process for the learning areas and topics and their content.

The outcome of this stage is shown in Table 2. This example is taken from the learning topic “involving patients and carers as partners in health care”.

Stage 3—Development of performance-based format

The completed context matrix was translated into a performance-based format, which takes full advantage of the modular nature of the Framework. The most extensive consultation occurred at this stage of the Framework’s development. Individual health-care workers were interviewed about aspects of every performance element in the Framework and the entire Framework document was distributed across the health-care sector for feedback.

The Curriculum Guide topics
1. What is patient safety?
2. What is human factors and why is it important to patient safety?
3. Understanding systems and the impact of complexity on patient care
4. Being an effective team player.
5. Understanding and learning from errors.
6. Understanding and managing clinical risk.
7. Introduction to quality improvement methods.
8. Engaging with patients and carers.
9. Minimizing infection through improved infection control.
11. Improving medication safety.

Rationale for each Curriculum Guide topic

Topic 1: What is patient safety?
Health professionals are increasingly being required to incorporate patient safety principles and concepts into everyday practice. In 2002, WHO Member States agreed on a World Health Assembly resolution on patient safety because they saw the need to reduce the harm and suffering of patients and their families as well as the compelling evidence of the economic benefits of improving patient safety. Studies show that additional hospitalization, litigation costs, infections acquired in hospitals, lost income, disability and medical expenses have cost some countries between US$ 6 billion and US$ 29 billion a year [2,3].

A number of countries have published studies highlighting the overwhelming evidence showing that significant numbers of patients are harmed due to their health care, either resulting in permanent injury, increased length of stay (LOS) in hospitals or even death. We have learnt over the last decade that adverse events occur not because bad people intentionally hurt patients but rather that the system of health care today is so
complex that the successful treatment and outcome for each patient depends on a range of factors, not just the competence of an individual health care provider. When so many people and different types of health-care providers (doctors, nurses, pharmacists and allied health) are involved, it is very difficult to ensure safe care unless the system of care is designed to facilitate timely and complete information and understanding by all the health professionals. This topic presents the case for patient safety.

**Topic 2: What is human factors and why is it important to patient safety?**

Human factors, engineering or ergonomics is the science of the interrelationship between humans, their tools and the environment in which they live and work [3]. Human factors engineering will help students understand how people perform under different circumstances so that systems and products can be built to enhance performance. It covers the human–machine and human-to-human interactions such as communication, teamwork and organizational culture.

Other industries such as aviation, manufacturing and the military have successfully applied knowledge of human factors to improve systems and services. Students need to understand how human factors can be used to reduce adverse events and errors by identifying how and why systems break down and how and why human beings miscommunicate. Using a human factors approach, the human–system interface can be improved by providing better-designed systems and processes. This involves simplifying processes, standardizing procedures, providing backup when humans fail, improving communication, redesigning equipment and engendering a consciousness of behavioural, organizational and technological limitations that lead to error.

**Topic 3: Understanding systems and the impact of complexity on patient care**

Students are introduced to the concept that a health-care system is not one but many systems made up of organizations, departments, units, services and practices. The huge number of relationships between patients, carers, health-care providers, support staff, administrators, bureaucrats, economists and community members as well as the relationships between the various health- and non-health-care services add to this complexity. This topic gives medical students a basic understanding of complex organizations using a systems approach. The lessons from other industries are used to show students the benefits of a systems approach.

When students think in systems they will be better able to understand why things break down and have a context for thinking about solutions. Medical students need to understand how an individual doctor or nurse working in a hospital can do their very best in treating and caring for their patients but alone that will not be enough to provide a safe and quality service. This is because patients depend on many people doing the right thing at the right time for them; in other words, they depend on a system of care.

**Topic 4: Being an effective team player**

Medical students’ understanding of teamwork involves more than identification with the medical team. It requires students to know the benefits of multidisciplinary teams and how effective multidisciplinary teams improve care and reduce errors. An effective team is one in which the team members communicate with one another as well as combining their observations, expertise and decision-making responsibilities to optimize patient care [4].

The task of communication and flow of information between health providers and patients
can be complicated due to the spread of clinical responsibility among members of the health-care team [5,6]. This can result in patients being required to repeat the same information to multiple health providers. More importantly, miscommunication has also been associated with delays in diagnosis, treatment and discharge as well as failures to follow up on test results [7-11].

Students need to know how effective health-care teams work, as well as techniques for including patients and their families as part of the health-care team. There is some evidence that multidisciplinary teams improve the quality of services and lower costs [12-14]. Good teamwork has also been shown to reduce errors and improve care for patients, particularly those with chronic illnesses [15-17]. This topic presents the underlying knowledge required to become an effective team member. However, knowledge alone will not make a student a good team player. They need to understand the culture of their workplace, and how it impacts upon team functioning.

**Topic 5: Understanding and learning from errors**

Understanding why health-care professionals make errors is necessary for appreciating how poorly designed systems and other factors contribute to errors in the health-care system. While errors are a fact of life, the consequences of errors on patient welfare and staff can be devastating. Medical students and other health-care professionals need to understand how and why systems break down and why mistakes are made so they can act to prevent and learn from them. An understanding of health-care errors also provides the basis for making improvements and implementing effective reporting systems [18]. Students will learn that a systems approach to errors, which seeks to understand all the underlying factors involved, is significantly better than a person approach, which seeks to blame people for individual mistakes. Leape’s seminal article in 1994 showed a way to examine errors in health care, that focused on learning and fixing errors instead of blaming those involved [19]. Although his message has had a profound impact on many health-care practitioners, there are still many embedded in a blame culture. It is crucial that students begin their vocation understanding the difference between blame and systems approaches.

**Topic 6: Understanding and managing clinical risk**

Clinical risk management is primarily concerned with maintaining safe systems of care. It usually involves a number of organizational systems or processes that are designed to identify, manage and prevent adverse outcomes. Clinical risk management focuses on improving the quality and safety of health-care services by identifying the circumstances and opportunities that put patients at risk of harm and acting to prevent or control those risks. Risk management involves every level of the organization so it is essential that medical students understand the objectives and relevance of the clinical risk management strategies in their workplace. Managing complaints and making improvements, understanding the main types of incidents in the hospital or clinic that are known to lead to adverse events, knowing how to use information from complaints, incident reports, litigation, coroners’ reports and quality improvement reports to control risks [20] are all examples of clinical risk management strategies.
Topic 7: Introduction to quality improvement methods
Over the last decade, health care has successfully adopted a variety of quality improvement methods used by other industries. These methods provide clinicians with the tools to: (i) identify a problem; (ii) measure the problem; (iii) develop a range of interventions designed to fix the problem; and (iv) test whether the interventions worked. Health-care leaders such as Tom Nolan, Brent James, Don Berwick and others have applied quality improvement principles to develop quality improvement methods for health clinicians and managers. The identification and examination of each step in the process of health-care delivery is the bedrock for this methodology. When students examine each step in the process of care they begin to see how the pieces of care are connected and measurable. Measurement is critical for safety improvement. This topic introduces the student to improvement methods and the tools, activities and techniques that can be incorporated into their practice.

Topic 8: Engaging with patients and carers
Students are introduced to the concept that the health-care team includes the patient and/or their carer, and that patients and carers play a key role in ensuring safe health care by: (i) helping with the diagnosis; (ii) deciding about appropriate treatments; (iii) choosing an experienced and safe provider; (iv) ensuring that treatments are appropriately administered; and (v) identifying adverse events and taking appropriate action [21,22]. The health-care system underutilizes the expertise patients can bring such as their knowledge about their symptoms, pain, preferences and attitudes to risk. They are a second pair of eyes if something unexpected happens. They can alert a health-care worker if the medication they are about to receive is not what they usually take, which acts as a warning to the team that checks should be made. Research has shown that there are fewer errors and better treatment outcomes when there is good communication between patients and their carers, and when patients are fully informed and educated about their medications [23-30]. Poor communication between doctors, patients and their carers has also emerged as a common reason for patients taking legal action against health-care providers [31,32].

Topic 9: Minimizing infection through improved infection control
WHO has a global campaign on infection control. We thought it important that this area be included in the Curriculum Guide not only for consistency but also because along with surgical care and medications these areas constitute a significant percentage of adverse events suffered by patients. The problem of infection control in health-care settings is now well established, with health care-associated infections being a major cause of death and disability worldwide. There are numerous guidelines available to help doctors and nurses minimize the risks of cross-infection. Patients who have surgery or an invasive procedure are known to be particularly prone to infections and account for about 40% of all hospital-acquired infections. The topic sets out the main causes and types of infections to enable medical students to identify those activities that put patients at risk of infection and to prepare students to take the appropriate action to prevent transmission.

Topic 10: Patient safety and invasive procedures
WHO has a project on safe surgery. One of the main causes of errors involving wrong patients, sites and procedures is the failure of health-care providers to communicate effectively (inadequate processes and checks) in preoperative procedures. Other examples of wrong site/procedure/patient are: (i) the wrong patient in
the operating room (OR); (ii) surgery performed on the wrong side or site; (iii) wrong procedure performed; (iv) failure to communicate changes in the patient’s condition; (v) disagreements about stopping procedures; and (vi) failure to report errors.

Minimizing errors caused by misidentification involves developing best-practice guidelines for ensuring the correct patient receives the right treatment [6]. Students can learn to understand the value of all patients being treated in accordance with the correct site/procedure/patient policies and protocols. Such learning would include the benefit of protocols as well as knowledge of the underlying principles supporting a uniform approach to treating and caring for patients.

One study of hand surgeons found that 21% of surgeons surveyed (n=1050) reported performing wrong site surgery at least once during their careers [33].

**Topic 11: Improving medication safety**

An adverse drug reaction has been defined by WHO [34] as any response to a medication that is noxious, unintended and occurs at doses used for prophylaxis, diagnosis or therapy. Patients are vulnerable to mistakes being made in any one of the many steps involved in ordering, dispensing and administering medications.

Medication errors have been highlighted in studies undertaken in many countries, including Australia, which [35] show that about 1% of all hospital admissions suffer an adverse event related to the administration of medications. The causes of medication errors include a wide range of factors including: (i) inadequate knowledge of patients and their clinical conditions; (ii) inadequate knowledge of the medications; (iii) calculation errors; (iv) illegible handwriting; (v) confusion regarding the name of the medication; and (vi) poor history taking [37].

**References**

2. How were the Curriculum Guide topics selected?


3. Aims of the Curriculum Guide

The aims of the Curriculum Guide are to:

• prepare medical students for safe practice in the workplace;
• inform medical schools of the key topics in patient safety;
• enhance patient safety as a theme throughout the medical curriculum;
• provide a comprehensive curriculum to assist teaching and integrating patient safety learning;
• further develop capacity for patient safety educators in medical schools;
• promote a safe and supportive environment for teaching students about patient safety;
• introduce or strengthen patient safety education in medical schools worldwide;
• raise the international profile of patient safety teaching and learning;
• foster international collaboration on patient safety education research in the higher education sector.

Underpinning principles

Capacity-building is integral to curriculum change

The main reason that WHO embarked on this project was to assist medical schools to develop patient safety education in their medical schools. The requirement of medical schools to develop and integrate patient safety learning into the medical curricula is a challenge for many medical schools because of the limited education and training of faculty staff in patient safety concepts and principles. One cannot expect medical schools to develop new curricula or review existing curricula if they are unfamiliar with the requirements of the discipline of patient safety.

Medical educators come from many backgrounds (clinicians, clinician educators, non-clinician educators, managers, health professionals) and their collective experience is necessary to deliver a rigorous medical programme. Many are experts in their particular disciplines and usually keep up to date using the accepted professional pathways for their area. Patient safety knowledge requires additional learning that falls outside these traditional routes. To be an effective patient safety teacher, health professionals need to be provided with the knowledge, tools and skills necessary for implementing patient safety education in their institutions. This is why a Teacher’s Guide (Part A) has been developed to accompany the Curriculum Guide. It provides practical advice and information for each stage of curriculum development and renewal, from assessing capacity to staff development to programme design and implementation.

A flexible curriculum to meet individual needs

We recognize that the curriculum of most medical programmes is already filled beyond capacity. This is why we have designed each topic as stand alone, thus allowing for wide variations in patient safety education implementation. The topics are also designed so they can be integrated into existing curricula, particularly in the doctor–patient stream. The topics in the Curriculum Guide have each been designed with enough content for a 60–90 minute educational session and feature a variety of ideas and methods for teaching and assessing so that educators can tailor material according to their own unique needs, context and available resources. There is no requirement to absolutely follow the outline provided. Teachers need to pay attention to the local environment, culture and student learning experiences and then select the most appropriate teaching method for the content selected.

At the understanding language for a targeted yet global audience

The Teacher’s Guide (Part A) of the Curriculum Guide is written for medical educators (those with
the capacity to introduce or enhance patient safety education at various levels), while the Curriculum Guide (Part B: Topics) is written for teachers and students. The Curriculum Guide was written with a global audience in mind and in language easily understood by those with English as both a first and second language.

A curriculum guide for all countries, cultures and contexts
Every attempt has been made to ensure that the content in this curriculum takes into account the wide variety of contexts in which medical educators and students teach and learn. An Expert Group, representing all WHO regions, has assessed the curriculum to ensure cultural appropriateness. Although some of the teaching activities and suggestions for students may not be culturally appropriate in every country, we are mindful that in all countries we need to change many of the aspects of clinical care. Much professional behaviour once thought appropriate is today no longer acceptable when taking patient safety considerations into account. For example, junior doctors or nurses will rarely speak up when they see a senior clinician about to make an error; this is universal and applies to all cultures to varying degrees. However, patient safety principles require that everyone is responsible for patient safety and should speak up even when they are lower in the medical and health-care hierarchy. Teachers will need to make a judgement about the health-care environment and whether it is ready and prepared for the introduction of patient safety.

Teaching and assessment strategies are designed to take into account both diversity in available resources and environmental differences, considerations that may be in terms of a developed versus developing country or a classroom versus a simulation centre.

A curriculum guide that is based on learning in a safe and supportive environment
We are mindful that students respond best when the learning environment is one that is safe, supportive, challenging and engaging. Patient safety learning occurs in many places—beside the bed, in simulated environments and in the classroom. It is essential that students are supported in their learning and not made to feel humiliated or inadequate. The activities in the Curriculum Guide are designed to be implemented in a supportive learning environment where students feel comfortable asking questions, volunteer what they do not understand and share their understanding in an honest and open way.

3. Aims of the Curriculum Guide
4. Structure of the Curriculum Guide

Teacher’s Guide (Part A)
The Teacher’s Guide (Part A) relates to building capacity for patient safety education, programme planning and design. Suggestions are provided regarding how patient safety education might be approached and implemented using the material presented in Part B. In Part A, we try to guide the reader through some important steps designed to support and achieve the implementation phase of curriculum development.

Curriculum Guide topics (Part B)
The topics represent the actual patient safety education curriculum.
5. Implementing the Curriculum Guide

How to use this Curriculum Guide
This Curriculum Guide provides you with resources for teaching medical students about patient safety. It identifies the topics to be taught, how it might be taught and how you can assess the different topics in the curriculum. Case examples have been selected and are available at the end of each topic. These cases can be used to demonstrate a particular aspect of the topic under discussion. We recognize that the best learning occurs when the case study used reflects local experiences; therefore, we encourage teachers to modify the cases so that they reflect the experiences of the health-care providers and locally available resources.

How to review your curriculum for patient safety learning

- Identify the learning outcomes
To start the process of curriculum development or renewal it is important to first identify the learning outcomes for patient safety. Part B contains the topics that have been chosen for this Curriculum Guide; whereas learning outcomes are further discussed in Part A.

- Know what is already in the medical curriculum
We use the word curriculum to refer to the broad spectrum of teaching and learning practices, including the strategies for developing skills and behaviours as well as using appropriate assessment methods to test whether the learning outcomes have been achieved. Medical students are guided in their learning by a medical curriculum that sets out the requisite knowledge, skills and behaviours required to demonstrate competency at the completion of their medical degree.

Before new material is introduced into a curriculum it is important to know what curriculum already exists as well as students’ clinical experiences in the hospitals and/or the different clinical environments. It may be that students are already experiencing some patient safety education in the hospitals and clinics that is not written down. The curriculum may already cover some aspects of this patient safety curriculum such as the importance of protocols in handwashing to avoid infection transmission. Getting a picture of existing material in the medical curriculum is necessary to identify those opportunities for enhancing patient safety teaching.

The patient safety curriculum we have designed is described in Part B of this document. We have identified the topics, resources, teaching strategies and assessment methods that will make patient safety teaching easier to introduce and integrate into the curriculum.

- Build on what is already in the curriculum
A good approach to patient safety education is to enhance existing parts of the medical curriculum rather than see patient safety as a new subject to teach. There are elements of patient safety that are new and will be additional to the existing curriculum, but there are many aspects of patient safety that can be added onto or achieved with further development of a subject or topic that already exists.

We have found that mapping topics or areas in the existing curriculum will help identify opportunities to include patient safety concepts and principles. Areas such as clinical skills development, professional and personal development, patient–doctor and community–doctor themes, health law, medical ethics, clinical ethics and communication are all suitable for including patient safety concepts and principles. The University of Sydney developed a template to review their medical curriculum and offer it as an example that can be followed (see Table 3).
Mapping medical curriculum will also help identify the opportunities for including patient safety concepts in an integrated fashion.

**How to assess the capacity of faculty to integrate patient safety teaching into the existing curriculum**

One of the biggest challenges facing all medical schools is the growing shortage of clinician teachers generally. There are few who know how to integrate patient safety principles and concepts into their clinical teaching. Many good clinicians intuitively adopt patient safety methods into their practice but may not know how to articulate what they do. Perhaps this is because they view any discussions about “systems” as the province of administrators and managers. Others may not think patient safety teaching important or relevant to their practice. Engaging clinicians in the area will be the first challenge for you. Building capacity of the faculty can take time, but there are a number of steps that can be taken to engage clinicians in patient safety teaching.

**Survey**

One way to find out who is interested in teaching patient safety is to conduct a survey of the clinicians who teach medical students. In some institutions there may be hundreds of teachers and in others not so many. Identify the clinicians who are in the best position to incorporate patient safety teaching and make sure they are included in the survey. The mapping exercise described above will help identify those people who currently teach and in a position to integrate patient safety concepts. The survey could include questions in relation to interest or knowledge of patient safety and practice in patient safety methods. This process could also identify those people who may be interested in forming a group or committee to oversee the development of the patient safety curriculum.

**Focus group**

Run a focus group of clinicians to find out what the current state of knowledge is about patient safety. This will also provide information about the clinicians’ attitudes towards including patient safety learning in the curriculum.

**Face-to-face meetings**

Individual meetings with clinicians will help to convey a clear message about patient safety education. This provides an opportunity to explain the basis and urgency for patient safety education as well as establish a relationship for later work.

**Convene a round table**

Invite a select group of clinicians who you think may be interested and those who are possible champions of a round table discussion about patient safety education for medical students. (The benefit of a round table format is that there is

<table>
<thead>
<tr>
<th>Session/area of the curriculum</th>
<th>Year</th>
<th>Where is the patient safety content?</th>
<th>Potential patient safety learning</th>
<th>How is patient safety being taught?</th>
<th>How is patient safety being assessed?</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethics</td>
<td>1</td>
<td>Respect for patient autonomy</td>
<td>Honesty after an adverse event</td>
<td>Lecture</td>
<td>Ethics essay, MCQ, OSCE</td>
<td>Many patient safety principles have an ethical basis that can be used to make explicit the patient safety lesson</td>
</tr>
</tbody>
</table>
Conduct a seminar on patient safety
Seminars are typical venues for building new knowledge. Seminars can be good for exposing clinicians new to the area to experts or respected clinicians who know about patient safety. Seminars can either be a half day or a full day. Topics that could be included in such a seminar include: (i) what is patient safety; (ii) the evidence of why patient safety is important; (iii) how to develop a curriculum for patient safety; (iv) how to teach patient safety; and (v) how to assess patient safety. It is important to remember to maintain context of the programme, which is to build capacity for faculty staff and clinicians to teach patient safety to medical students.

How to identify like-minded colleagues or associates
If you undertake the activities set out above in relation to building capacity this will help identify like-minded people interested in teaching patient safety. Another way is to convene a meeting and send an open invitation to faculty staff and clinician teachers. Make sure to schedule the meeting at a time convenient for as many people as possible in order to attract maximum attendance (for example, clinicians who see patients during the day may want to come but cannot because of work demands). Another way is to put an article in the faculty newsletter or university news. This will let people know about patient safety, and even if they are not interested in getting involved, the article will raise awareness of the need to include patient safety education in the curriculum.

Patient safety teaching requires the engagement of interested and knowledgeable staff who either self-select, or have been appointed or nominated as a result of previous contacts or meetings about patient safety. It is also a good idea to check the availability of experts from other faculties and disciplines such as nursing, engineering (human factors knowledge), psychology (behavioural psychology, process and improvement theories) and pharmacy (medication safety).

Techniques to find out where patient safety could fit into the medical curriculum
Brainstorming is a technique that requires and encourages everyone to suggest ideas for solving a problem. The problem being how to best introduce patient safety learning into the curriculum. Each medical school will be different; they will have different resources, capacity and interest in patient safety. Patient safety may not yet be a community or government concern so the urgency to include patient safety education may not be a priority.

Convening introductory workshops on the Curriculum Guide for medical students will provide an opportunity for members of the faculty to become familiar with the core topics in patient safety. It will also allow them to express any reservations they have about the programme and clarify any concerns or questions.

Patient safety is best considered in the context of multidisciplinary learning. Staff should be encouraged to reflect on the feasibility of combining some of the patient safety sessions with other health professionals. While this Curriculum Guide has been designed for medical students, it can easily be adapted to other health-care students. Other professions and disciplines have much to contribute, particularly in teaching some of these topics. Engineers may be able to teach about systems, safety cultures and human factors engineering. Psychologists and behavioural scientists, nursing and pharmacy
faculty can teach about how their disciplines have made safety improvements. Striving for diversity gives the maximum chance to enable students to learn from other disciplines, particularly in the context of a team approach to patient safety.

**Reaching agreement**

As in all discussions about curriculum there will be different views about what should be included and what should be left out. The important thing is to start and build on that. This means that compromise may be better in the long run—getting something started rather than debating and discussing the issues for lengthy periods of time. Another technique is to introduce new topics into the curriculum using a pilot, which could identify any problems and be used as a guide for future topics. It also allows faculty staff members who are unsure of the value of patient safety learning to get used to the idea.

The next section gives more details about developing and integrating the Curriculum Guide into existing curriculum.
6. How to integrate patient safety into your medical school curriculum

**General comments**
Patient safety is a relatively new discipline and introducing any new material into an existing medical curriculum is always challenging. What should be taught? Who should teach it? Where and how will it fit in with the rest of the curriculum? What does it replace?

If your medical school is in the process of renewing an existing curriculum or if you belong to a new medical school, this is an ideal time to make a case for allocating space for patient safety education. However, most medical school curricula are well established and already full. It is unusual to find a block of free time waiting for a new area of study.

This section provides ideas on how to integrate patient safety teaching and learning into an existing medical curriculum. The benefits and challenges of different approaches will be covered to help you determine the likely best fit for your school and to help you anticipate and plan what is required.

**The nature of patient safety education:**
- it is new;
- it spans a number of fields not traditionally taught in medical schools such as human factors, systems thinking, effective teamwork behaviours and managing error;
- it links with many existing and traditional medical school subjects (applied sciences and clinical sciences) (see Box 1 for examples);
- it contains new knowledge and performance elements (see Box 2 for examples);
- it is highly contextual.

**Box 1. Linking patient safety education with traditional medical school subjects**
An example of how a patient safety topic such as correct patient identification has specific applications in numerous disciplines in medicine:

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Patient safety application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obstetrics</td>
<td>How are newborn babies identified as belonging to their mother so that babies are not accidentally mixed up and leave hospital with the wrong parent(s)?</td>
</tr>
<tr>
<td>Surgery</td>
<td>If a patient needs a blood transfusion, what checking processes are in place to ensure they receive the correct blood type?</td>
</tr>
<tr>
<td>Ethics</td>
<td>How are patients encouraged to speak up if they do not understand why the doctor is doing something to them that they were not expecting?</td>
</tr>
</tbody>
</table>

**Box 2. Linking patient safety education with new knowledge and performance elements**
Patient safety competencies for a particular topic can be divided into knowledge and performance requirements. Ideally, learning will occur in both categories, e.g. correct patient Identification

<table>
<thead>
<tr>
<th>Domain</th>
<th>Patient safety example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broad knowledge</td>
<td>Understanding that patient identification mix-ups can and do occur, especially when care is delivered by a team. Learning what situations increase the likelihood of a patient mix-up such as having two patients with the same condition, patients who cannot communicate and staff being interrupted mid-task.</td>
</tr>
<tr>
<td>Applied knowledge</td>
<td>Understanding the importance of correct patient identification when taking blood for cross-matching. Understanding how errors can occur during this task and learning about the strategies used to prevent error in this situation.</td>
</tr>
<tr>
<td>Performance</td>
<td>Demonstrating how to correctly identify a patient by asking the patient their name as an open-ended question such as “What is your name?” rather than as a closed question such as “Are you John Smith?”</td>
</tr>
</tbody>
</table>
The field of patient safety is also very broad. Given this breadth and the need for contextualizing patient safety principles, there are likely to be many opportunities in your curriculum to incorporate effective patient safety education into existing sessions. However, some areas of patient safety are relatively new to medicine and may not be so easy to graft onto an existing session and hence are likely to need their own time slot in the curriculum.

**How to establish best fit using generic curriculum structures**

Once you have reviewed your existing curriculum, determined what patient safety areas are already taught and decided what patient safety topics you want to teach, it is time to think about how to incorporate the new content into your curriculum.

When thinking about your medical school’s curriculum consider the following questions:

- **How is your overall curriculum structured?**
- **When and where in the curriculum are particular subjects and topics taught that might lend themselves to inclusion of patient safety content?**
- **How are individual topics structured in terms of learning objectives, delivery methods and assessment methods?**
- **How is your curriculum delivered?**

Once you have answered these questions it will become more apparent where and how patient safety can be included in your curriculum.

**How is your overall curriculum structured?**

- **Is it a traditional curriculum?** Students first learn about the basic and behavioural sciences and once these are complete, concentrate on the clinical disciplines. Education tends to be discipline-specific rather than integrated.

In this setting, clinical application and performance elements of patient safety may be best introduced in the later years of the course. However, broad knowledge of patient safety principles can still be effectively introduced in the early years.

- **Is it an integrated curriculum?** Basic, behavioural and clinical sciences and clinical skills are covered in parallel throughout the course and learning is integrated.

In this setting, there are advantages to vertical integration of knowledge, application and performance elements of patient safety education throughout the course.

**Knowledge and performance requirements of patient safety:**

- Are ideally learnt in the context of the clinical setting; relevance is more apparent once students understand how health care is delivered and are more familiar with the workplace environment.
- Will be more likely to change practice if students have the opportunity to use what they have learnt shortly after it is covered in the curriculum.

When teaching a patient safety topic, there are advantages if the knowledge and performance requirements are covered together. A clear understanding of the scope of a problem inpatient safety will provide motivation and insight when learning about performance requirements.

Students are also less likely to feel demoralized about the risks facing patients from the healthcare system they will soon be a part of; if they explore solutions (applications) and learn practical strategies (performance elements) to make them safer doctors at the same time, they will be more positive. For logistical reasons it may not be
possible to cover the knowledge and performance requirements of a patient safety topic at the same time. For example, there is a lecture on medication error in the second year but the students do not practise safe drug administration techniques until a clinical skills workshop in the fourth year. If this is the case, it will be helpful to inform students in the second year that they will learn safe drug administration in the fourth year, and then in the fourth year, refer back to the lecture they had in the second year on medication error. This way motivation for safe practice will not be lost and students will feel more confident about their potential to graduate as a safe practitioner.

If your curriculum is traditional, then knowledge and performance requirements of patient safety are best taught in later years when students have more knowledge of the clinical disciplines, exposure to patients and clinical skills training. The context for the knowledge and performance requirements should match the students’ ability to put into practice their new knowledge. Introductory patient safety knowledge can still be included in the early years in subjects such as public health, epidemiology, ethics or other behavioural science-based subjects. Suitable topics for early introduction include: (i) what is patient safety; (ii) introduction to human factors engineering; and (iii) systems and complexity in health care.

If your curriculum is integrated and students are taught clinical skills from the first year, then patient safety topics are best introduced early and vertically integrated throughout the entire course. This makes patient safety a constant theme and provides opportunities to reinforce and build upon earlier learning. Ideally, students should be exposed to patient safety education prior to and upon entering the clinical environment.

When and where in the curriculum are particular subjects and topics taught that might lend themselves to inclusion of patient safety teaching?

Box 3 sets out opportunities for examining integration of patient safety topics.

### Box 3. Integration of patient safety topics

<table>
<thead>
<tr>
<th>Patient safety topic</th>
<th>Subjects that could house patient safety topics.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimizing infection through improved infection control</td>
<td>Microbiology                          Pharmacology</td>
</tr>
<tr>
<td></td>
<td>Procedural skills training              Therapeutics</td>
</tr>
<tr>
<td></td>
<td>Infectious diseases                    Advanced life-support training</td>
</tr>
<tr>
<td></td>
<td>Clinical placements                    Orientation programmes</td>
</tr>
<tr>
<td></td>
<td>Communication skills training (interprofessional)</td>
</tr>
<tr>
<td>Improving medication safety</td>
<td>Ethics</td>
</tr>
<tr>
<td>Being an effective team player</td>
<td>Introduction to the clinical environment</td>
</tr>
<tr>
<td>What is patient safety?</td>
<td>Clinical and procedural skills training</td>
</tr>
</tbody>
</table>
Any clinical discipline can potentially house a patient safety topic if a sample case is part of the session and is relevant to that discipline. For example, a case involving a medication error in a child could be used as the starting point for teaching about understanding and learning from errors while studying paediatrics. Similarly, during the surgical rotation a clinician could teach the topic “patient safety and invasive procedures”. Medicine or obstetrics could house the topic of “understanding and learning from errors” if the case was relevant to that particular discipline. The learning, however, is generic and relevant for all disciplines and all students.

How are individual curriculum topics structured in the following areas?

- learning objectives
- delivery methods
- assessment methods.

Implementation of new patient safety content into your curriculum will be more efficient if the associated learning objectives, delivery and assessment methods are consistent with the structure of objectives, delivery and assessment methods of existing subjects.

How is your curriculum delivered?

- lectures
- clinical placements
- online activities
- on the ward activities
- small group tutorial teaching
- problem-based learning (PBL)
- simulation/skills laboratories
- traditional tutorials.

It will probably be easier to incorporate patient safety topics into pre-existing educational delivery methods familiar to students and staff.

Examples of models for implementation

Example 1: Patient safety as a stand alone subject in a traditional curriculum occurring in the final years. See chart 1.

- educational methods could consist of a combination of lectures, small group discussions, project work, practical workshops or simulation-based exercises;
- adding a layer of patient safety to prior knowledge before entering the workforce.

Chart 1: Implementation of patient safety as a stand alone subject in a traditional curriculum

<table>
<thead>
<tr>
<th>Years 1 and 2: basic, applied and behavioural sciences</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Years 3 and 4: clinical disciplines and clinical skills</td>
<td>Patient safety topics</td>
</tr>
</tbody>
</table>
Example 2: Patient safety as a stand alone subject in an integrated curriculum. See chart 2.

Patient safety could be a stand alone subject with links to other subjects, e.g. lectures at the start of term that relate to topics that will come up in tutorials or on placement over the course of the year.

Chart 2: Implementation of patient safety as a stand alone subject in an integrated curriculum

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Topics 1 and 2: What is patient safety?; introduction to human factors engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 2</td>
<td>Topics 3 and 5: understanding systems and the impact of complexity on patient care; understanding and learning from errors</td>
</tr>
<tr>
<td>Year 3</td>
<td>Topics 4, 7, 9 and 10: being an effective team player; methods for quality improvement; minimizing infection through improved infection control; reducing risks associated with invasive procedures</td>
</tr>
<tr>
<td>Year 4</td>
<td>Topics 6, 8 and 11: how to manage clinical risk; engaging with patients and carers; improving medication safety</td>
</tr>
</tbody>
</table>

PBL

Clinical skills workshops and clinical placements
Example 3: Integrating patient safety into pre-existing subjects—example A. See chart 3.

A number of subjects could set aside some sessions where the main objective of the tutorial or lecture is to cover a patient safety topic.

In the fourth year there could be a lecture on medication safety as part of therapeutics, a workshop on safe drug administration in the clinical skills programme and a PBL case that demonstrates the multifactorial nature of error using a case of medication error.

### Chart 3: Implementation of patient safety as a stand alone subject in an pre-existing subjects (A)

<table>
<thead>
<tr>
<th>Year 1</th>
<th>PBL</th>
<th></th>
<th>Patient safety case</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Clinical skills</td>
<td>Patient safety activity</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lecture Patient Safety topic</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 2</th>
<th>PBL</th>
<th></th>
<th>Patient safety case</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Clinical skills</td>
<td>Patient safety activity</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lecture Patient Safety topic</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 3</th>
<th>PBL</th>
<th></th>
<th>Patient safety case</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Clinical skills</td>
<td>Patient safety activity</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lecture Patient Safety topic</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 4</th>
<th>PBL</th>
<th></th>
<th>Patient safety case</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Clinical skills</td>
<td>Patient safety activity</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lecture Patient Safety topic</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6. How to integrate patient safety into your medical school curriculum

Example 4: Integrating patient safety into pre-existing subjects—example B. See Chart 4.

Work together with subject leaders to incorporate elements of patient safety into selected educational sessions. Although the main focus of the session is not a patient safety topic, elements of patient safety education are weaved into the session. For this to occur, session objectives should include an element of patient safety. See Box 4 for examples.

Chart 4: Implementation of patient safety as a stand alone subject in an pre-existing subjects (B)

<table>
<thead>
<tr>
<th>Year 1</th>
<th>PBL</th>
<th>Patient safety case</th>
<th>Patient safety case</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Clinical skills</td>
<td>Patient safety activity</td>
</tr>
<tr>
<td></td>
<td>Lecture</td>
<td>Patient safety topic</td>
<td>Patient safety activity</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 2</th>
<th>PBL</th>
<th>Patient safety case</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Clinical skills</td>
</tr>
<tr>
<td></td>
<td>Lecture</td>
<td>Patient safety topic</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 3</th>
<th>PBL</th>
<th>Patient safety case</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Clinical skills</td>
</tr>
<tr>
<td></td>
<td>Lecture</td>
<td>Patient safety topic</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 4</th>
<th>PBL</th>
<th>Patient safety case</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Clinical skills</td>
</tr>
<tr>
<td></td>
<td>Lecture</td>
<td>Patient safety topic</td>
</tr>
</tbody>
</table>
6. How to integrate patient safety into your medical school curriculum

Box 4. Examples of how patient safety topics can be weaved in with pre-existing sessions

<table>
<thead>
<tr>
<th>Pre-existing session</th>
<th>Patient safety education component</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical skills tutorial at the bedside</td>
<td>Patients are always provided with an explanation and consent to being part of the educational process at the start of the session. Tutors role model respecting patients wishes. Patients are always included as part of the team. Tutors invite patient to join case discussion as they have information important to their care.</td>
</tr>
<tr>
<td>Procedural skills session on IV cannulation</td>
<td>Sterile technique and sharps disposal are included. Involve patient in risk discussion about infection. Practise consent.</td>
</tr>
<tr>
<td>Lecture on blood transfusion</td>
<td>Patient risk and ways to minimize risk are included as part of the lecture. Verification protocols to ensure correct patient.</td>
</tr>
<tr>
<td>PBL on pulmonary embolism where the index case is commenced on an oral anticoagulant</td>
<td>Students are encouraged to discuss the importance of patient education when prescribing potentially dangerous medication.</td>
</tr>
</tbody>
</table>

The more patient safety topics are integrated into the established curriculum, the easier it will be to incorporate the performance requirements in a meaningful way, and provide context for patient safety concepts.

However, there should be a word of caution: the more that patient safety is integrated into the existing curriculum, the more it is dispersed, dependent on a greater number of teachers and it becomes harder to coordinate effective delivery. You will need to find the balance between integration of the new material and ability to coordinate its delivery. It is a good idea to keep a detailed record of what patient safety is integrated into the existing curriculum, how it is being taught and how it is being assessed. From an educational perspective, integration of patient safety is ideal; however, this aim needs to be balanced by the practicalities of implementation. When asked by a university or accrediting body where and how patient safety is taught to medical students the faculty needs to have information that is sufficiently detailed to allow an observer to attend such a session and see patient safety education being delivered. It may be that a combination of the above approaches is more appropriate for your setting.

Once you have an overall plan of what, where and how you want to incorporate patient safety into your curriculum, it will be easier to add to the curriculum in a piecemeal fashion, topic by topic over time, rather than trying to add every aspect of your plan at once. This way you can learn as you go, and start achieving small goals early.

Integration of patient safety into a problem-based learning programme

Many medical schools use PBL as a major component for delivering curriculum. One of the many benefits of PBL is the integration of basic, behavioural and clinical science material in the context of solving a clinical problem. If the clinical problem also includes aspects of the realities of the health-care delivery system then there will be opportunities to explore issues relating to patient safety. PBL is well suited to patient safety teaching and learning. This section provides ideas to help you effectively include patient safety material into your PBL programme.
There are many variations of the PBL process. The relevance of some of the ideas we present will depend on which PBL model your school has adopted. In this section, PBL is assumed to have the following characteristics:

- small group learning with a facilitator (tutor or teacher) present;
- a clinical case is used as the starting point for learning;
- as students attempt to understand the case through group discussion, issues and problems arise that will form the basis of further study;
- students undertake self-directed study (resources may be provided to help guide students with their study);
- students come together as a group to share their learning and collectively improve their understanding of the issues that arose from the clinical case;
- PBL sessions have specified learning objectives and PBL learning is assessable.

The nature of the PBL process is aligned with strategies that promote patient safety in the workplace such as:

- collaborative learning;
- reviewing cases, identifying problems and issues as a group;
- sharing the workload and exploring/researching problems as an individual;
- learning from and teaching peers;
- group problem solving;
- respecting roles and responsibilities;
- showing respect to colleagues.

Many of the skills developed in the PBL process will assist students to be effective future members of health-care teams involved in continuous quality improvement in the workplace.

How learning issues emerge from the problem-based learning case

For a PBL session to achieve its aims the clinical case needs to be written in a way that promotes curiosity and discussion.

Example of a PBL case:

Jeremy So is a 15-year-old boy who arrives at the local medical clinic with noisy breathing and itch. His father says he was fine 30 minutes ago and that he just became unwell quite suddenly. On examination, Jeremy looks distressed and nervous. He has a puffy face, his lips are huge and he can hardly open his eyes as they are so swollen. He has red blotches on his skin and he is scratching his body. Every time he breathes in he makes a noise.

From this case a number of questions may arise in the minds of the students:

- What is the most likely diagnosis? What else could it be?
- What could have caused the problem?
- How does the diagnosis explain all the clinical features?
- What is the underlying pathophysiology of the condition—can the features be explained by understanding the pathophysiology?
- What is likely to happen to Jeremy if he does not get treatment?
- What is the treatment?

Example of the same case written to elicit discussion of medical error as well as answers to the above questions:

Jeremy is a 15-year-old boy who arrives at the local medical clinic with noisy breathing and itch. His father says he was fine 30 minutes ago and that he just became unwell quite suddenly. On examination, Jeremy looks distressed and nervous. He has a puffy face, his lips are huge and he can hardly open his eyes as they are so
swollen. He has red blotches on his skin and he is scratching his body. Every time he breathes in he makes a noise.

Jeremy’s father says his son was like this once before after having some medicine called penicillin and he was told never to have penicillin again because it could kill him. Jeremy saw a doctor this morning because of a runny nose, sore throat and fever. The doctor prescribed amoxicillin, which Jeremy started earlier today. Jeremy’s father wonders if his son might also be allergic to this new medicine amoxicillin.

With the case written in this way some additional questions for discussion may arise:

- How might Jeremy have been given amoxicillin when he has a known serious allergy to penicillin?
- Why was Jeremy prescribed an antibiotic when the most likely cause of his symptoms is a viral upper respiratory tract infection?
- This problem was preventable; has someone made a mistake?
- How can this type of situation be prevented? What is the doctor’s role? What is the patient/carer’s role in prevention of this situation?
- How much should the doctor explain to Jeremy and his father about how the mistake was made?

In addition to a well-written case, clearly stated learning objectives help keep students’ discussion on the intended path. It may be that only the teacher has access to the learning objectives and can guide students in the right direction if need be. So, in this sample case, as well as objectives that relate to the pathophysiology, clinical manifestations and treatment of severe allergic reactions, one or two of the objectives could be focused on patient safety issues.

For example:
- list a doctor’s responsibilities when prescribing medication.
- list strategies to minimize patients being given medications that may harm them.

Some schools may provide students with predetermined questions as part of the PBL process. For example:

- What are doctors’ responsibilities when prescribing a new medication?
- How is a thorough allergy history performed?
- Define the following terms: medical error, adverse event, near miss.

Suggestions for adjusting problem-based learning sessions to include elements of patient safety

- Include information in the case that relates to a patient safety issue. To achieve this, include aspects of the realities of the health-care delivery system, which will provide opportunities to explore issues relating to patient safety.
- Make the case relevant to your local health-care environment.
- The case may include a near miss or adverse event such as the above example.
- The case may include a threat to patient safety thus helping students to recognize where the hazards in the system are.

A case may include a nurse (or medical student) noticing some important information that the doctor has overlooked. The case can describe the nurse being assertive (speaking up), the doctor being receptive to the nurse and the patient’s care being improved as a result.

The patient safety issue may be a major or minor component of the case.
- If your school has learning objectives for each PBL case, include patient safety knowledge.
in the objectives.

- If your school has pre-determined questions for PBL cases, include questions about patient safety.
- If your school provides resources and/or reference material for students doing PBL cases, include patient safety literature.
- If your school provides tutor notes as part of the PBL process, include patient safety literature.
- Use PBL cases that cover broad patient safety concepts early in the programme (such as the multifactorial nature of error or human factors) and cases that include specific applications of patient safety concepts later in the programme. This will help students reinforce major concepts over time and apply their knowledge to different situations.

Integration of patient safety into a procedural skills training programme

Invasive procedures have the potential to harm patients. This is especially so when procedures are being done by learners who are still lacking in experience. Procedures can cause harm through complications, pain and emotional distress, not being effective and not being necessary in the first place. The knowledge, skill and behaviour of the doctor performing the procedure can help to minimize some of the potential risks for patients. Integrating patient safety education with procedural skills training at an undergraduate level will help medical students to be mindful of their responsibilities to patients when embarking on invasive procedures. This section provides some suggestions on how to integrate patient safety education with procedural skills training in your school.

As a starting point, consider the following questions:
1. When, where and how are procedural skills taught in your school?
2. What are the skills taught?

3. When do students start to perform these procedures on patients? Ideally, the patient safety messages should precede or coincide with this.

Patient safety topics to consider including in a procedural skills training programme

Broad patient safety topics that are relevant for all procedures:

- The learning curve. Understand that an inexperienced clinician is more likely to cause harm and/or fail a procedure compared to an experienced clinician. What strategies can be used to help minimize harm while still allowing for learning to take place; for example, the role of careful preparation, planning, background knowledge, observation of others performing the procedure, simulation, supervision, feedback and follow-up of patients (topics 2, 5 and 6).
- What is the required background knowledge a doctor needs to acquire about a procedure before undertaking that procedure (topics 6 and 10)?
- Sterile precautions (topic 11).
- Communicating risk (topics 6 and 9).
- Correct patient identification, correct side, correct patient (topic 10).
- Follow-up of test results (topics 2, 6, 9 and 10).

Patient safety knowledge and skills applied to the performance of specific procedures:

- Common problems/hazards/traps, trouble shooting (topics 2 and 5).
- Common and serious complications and how to minimize them (topic 1 and 5).
- Advice for patients regarding follow-up (topics 6 and 9).
- Equipment familiarity (topic 2).
- Specific applications of broad patient safety topics (all topics).
For example: Correct patient identification when taking a blood sample. How to label sample tubes to minimize chance of misidentification: label at the bedside, check patients name with an open-ended question, make sure the patient’s name matches the label on the sample tube and the label on the request form, i.e. perform a “three-way check”.

A variety of educational methods can be used to introduce the broad patient safety topics as they apply to performing invasive procedures—for example, lectures, readings, group discussion, tutorials, online activities and even PBL.

The best time to learn the knowledge and performance requirements of a patient safety topic is when learning the steps of the procedure. This may occur in a practical tutorial at the bedside, using simulation in a skills laboratory or as a tutorial without a “hands-on” component. Students could be asked to read a particular article or guidelines prior to attending the teaching session.

Tutorials on particular procedures provide an excellent opportunity to reinforce generic principles, to detail patient safety applications for a particular procedure and for students to practise performance elements of patient safety.

If your school utilizes immersive scenario-based simulation training, for example, to learn basic and advanced life support, there is an opportunity to incorporate team training into that programme. The advantages of this type of training for incorporating patient safety issues are the realistic situations that mirror many real-life challenges that can emerge from the scenario. For example, knowing what to do in an emergency situation is different from actually doing it, especially when working as part of a team. The real elements introduced are time pressure, stress, teamwork, communication, equipment familiarity, decision-making in action and knowing the environment. Similar to other forms of experiential learning, there are opportunities to practise the performance requirements demonstrating safe practice.

Note: Immersive scenario-based teaching using simulation can be a highly effective way for students to learn, but can also be quite confronting for students and not always a comfortable way to learn. Attention to creating a safe and supportive learning environment is very important if this educational method is used. See the section on underpinning educational principles for more details on creating a safe and supportive learning environment.

Clinical skills training programme
Clinical skills training includes learning how to take a history, how to perform a physical examination, clinical reasoning, test ordering and interpretation, procedural skills and communication skills such as providing information, counselling and obtaining informed consent.

A range of methods are used to teach clinical skills such as bedside tutorials, practising with simulated patients, practising with peers, observing videos of expert performance, participation in the clinical environment and presenting cases.

Consider when and how your school delivers its clinical skills programme.

A number of patient safety topics will be appropriate for inclusion in a clinical skills programme. And since the programme may offer opportunities to practise performance elements of patient safety, it is important that good habits be developed early. Note that bedside tutorials offer rich opportunities for tutors to role model safe practice—for example, patient-centred communication and hand hygiene.
Clinical skills training may provide opportunities for students to learn about and practise the following patient safety performance elements:

- communicating risk;
- asking permission;
- accepting refusal;
- being honest with patients;
- empowering patients—helping patients be active participants in their own care;
- keeping patients and relatives informed;
- hand hygiene;
- patient-centred focus during history taking and physical examination;
- clinical reasoning—diagnostic error, consideration of risk benefit ratio of procedures, investigations and management plans.

How to collaborate with ward-based teachers and teachers of clinical skills

For patient safety principles to be integrated broadly throughout the curriculum, the cooperation of many individual teachers will need to occur, particularly if patient safety education is to be delivered in small group settings such as PBL and clinical skills tutorials.

We mentioned in the beginning of this section that many teachers will not be familiar with patient safety concepts and specific knowledge and performance requirements will be new. For example, students may see clinicians in the workplace asking patients their name in a hurried and disrespectful manner, taking shortcuts that may compromise patient safety or display a “blame and shame” attitude when things go wrong. Tutors will need to reflect on their own practice if they are to be effective patient safety teachers and role models.

The following strategies may assist to engage clinical teachers in patient safety teaching:

- conduct a patient safety workshop or lecture series for teachers;
- invite guest speakers to promote patient safety;
- engage/excite teachers about the inclusion of patient safety in the curriculum;
- parallel patient safety education in the postgraduate setting;
- clearly state patient safety learning objectives in tutor notes;
- provide tutors notes on patient safety topics;
- assess patient safety content in exams.

Using case studies

Build local case studies

Case studies can either demonstrate how not to do something (learning from a person’s negative experience) or how to do something right (learning from a person’s positive experience). For example, if a case study is being developed for the topic “being an effective team player”, then the local case study would have elements of teams that are familiar to the local institutions, local clinics or hospitals.

The following steps will assist in building local cases relevant to the topic being taught.

- Review the sections of each topic in this Curriculum Guide outlining:
  - the relevance of the topic to the workplace;
  - the learning objectives for the topic.
- Write down the activities that are captured in the objectives.
- Obtain case studies from:
  - the Curriculum Guide; or
  - ask doctors and nurses in the hospital or clinic to provide cases that can be identified.
- Develop a story that contains the elements set out in the objectives.

The context of the case study should be familiar to the students and clinicians. For example, if there are no intensive care units (ICUs) locally available, then the case studies should avoid mentioning ICUs or placing the case study in an ICU.
How to modify the case studies in the Curriculum Guide

Most of the case studies are written to illustrate a behaviour or process. Many of the cases we have selected and those supplied by the WHO Expert Group relate to more than one topic such as understanding errors, communication, teamwork and engaging with patients. We have listed all of the cases under each topic that we think could be used to demonstrate an appropriate learning objective. Different types of cases have been used, ranging from health services that rely heavily on technology to ones with limited access to technological services. This means that many of the case studies will apply to most medical schools; if not, the case studies can be modified by changing the environment in which the case takes place. The case can also have another type of health provider involved when the one identified in the case study does not exist. For example, patients can be changed from male to female or female to male (if clinically appropriate), can have family members present or absent, or come from a rural area or a city. After a case study has been modified to take into account local elements, give the case study to a colleague to see if it makes sense and is relevant to the topic, local environment and context.
For patient safety education to result in safe practice and improved patient outcomes it needs to be meaningful to students. As with any teaching, one of the major challenges is to ensure transfer of the learning to the workplace. What can educators do to encourage students to apply their learning in a practical way on the job?

The following strategies can help.

**Context is highly relevant in teaching patient safety**

Contextualize patient safety principles
Patient safety principles need to be made relevant to the daily activities of health-care workers. Aim to show students when and how patient safety knowledge can be applied in practice. This means using examples that students can relate to.

**Use examples that are realistic for your setting**
Think about the sort of work most of your students will be doing after they graduate and have this in mind when choosing clinical contexts in which to incorporate patient safety education. Including a case about malnutrition, morbid obesity or malaria is not particularly useful if these conditions are extremely uncommon in your clinical practice setting. Use situations and settings that are common and relevant for the majority of your graduates.

**Identify practical applications**
Help students identify the situations in which they can apply their patient safety knowledge and skills. This way they are more likely to recognize opportunities for safe practice in the workplace as they arise. For example, correct patient identification is important in:
- sending off blood samples;
- administering medication;
- putting labels on imaging request forms;
- writing in patients files;
- writing on patients medication charts;
- performing procedures;
- working with patients who have difficulty with communication.

**Use examples that are of interest or soon will be relevant to students**
Draw on situations that the students may find themselves in when they are junior doctors and/or as medical students on clinical placement. For example, if the topic is about being a patient advocate, it is far better to use an example of a student being assertive with a surgeon rather than the senior hospital doctor needing to be assertive with hospital management. This way, the relevance of the material will be more apparent to students, resulting in better motivation for learning (see Box 5 for an example).

**Box 5. Practical application example**

While observing a surgical operation a medical student notices that the surgeon is closing the wound and there is still a pack inside the patient. The student is not sure if the surgeon is aware of the pack and is wondering whether to say something.

**Give students the opportunity to practise applying their patient safety knowledge and skills**
By giving students the opportunity to practise “safe practice”, it will hopefully become habitual, and students will be more inclined to approach clinical situations with a patient safety mindset.

Practising “safe practice” can occur as soon as students commence their medical training—for example, in:
- tutorials or private study, e.g. brainstorming solutions for hazardous situations;
- a simulation setting, e.g. skills laboratory.
simulation laboratory, role play;
• the clinical environment, e.g. hand hygiene when seeing patients, correct patient identification when drawing blood from a patient;
• patient interactions—when advising, students can practise encouraging patients to be informed, ask questions and be proactive in ensuring care progresses as planned.

Create an effective learning environment
Aspects of the learning environment can also have a bearing on the effectiveness of teaching and learning. An ideal learning environment is one that is safe, supportive, challenging and engaging.

Safe and supportive learning environments
A safe and supportive learning environment is one in which:
• students feel comfortable to ask “stupid” questions;
• volunteer what they do not understand;
• share what they do understand in an honest and open way.

Students who feel safe and supported tend to be more open to learning, enjoy being challenged and are more prepared to actively participate in learning activities.

If students feel unsafe and not supported they will tend to be reluctant to disclose knowledge deficits and less likely to engage actively for fear of feeling embarrassed or being humiliated in front of their teachers and peers. The student’s primary aim becomes self-preservation rather than learning. Attention to creating a safe and supportive learning environment not only makes learning more enjoyable, but also, importantly, makes learning more effective. The teacher has a significant role in making the learning environment a comfortable place for students.

Suggestions for helping to create a safe and supportive learning environment:
• Introduce yourself to students and ask the students to introduce themselves. Show an interest in them as individuals as well as showing an interest in their learning.
• At the start of your teaching session, explain how the session will run. This will let the students know what to expect, and also what is expected of them.
• Orient learners to the environment you are teaching in. This is especially important if you are in the clinical environment or a simulation environment. Students need to know what is expected of them if they are in a new setting. Simulation environments can be confusing as some aspects are real, some aspects are not, and the learner is asked to pretend that some aspects are real. Make sure the learners know the level of immersion required for the role play, and how realistically you expect them to treat the situation. It may be embarrassing for a student to talk to an intravenous (IV) cannulation insertion practice arm as if it were a real patient when the teacher’s intention was just to use the IV insertion practice arm for practising the manual aspects of the task.
• Invite students to ask questions and speak up if there is anything they do not understand. This sends the message that not knowing is okay.
• Never criticize or humiliate a student for lack of knowledge or poor performance. Rather, this should be viewed as a learning opportunity.
• If active participation is required, ask for volunteers rather than singling people out yourself.
• Consider demonstrating how to do something yourself before asking students to have a turn. For example, when teaching about how to create a sterile field before doing a lumbar
When asking questions of a group of students it is best to ask the question first, then give students time to think about the question and then look for someone to provide a response. Avoid choosing a student before asking the question. Some students will find this unnerving and may have trouble thinking clearly if a whole class is waiting for their response.

If, as the teacher, you are asked a question you do not know the answer to, do not try to hide this fact or apologize for not knowing. To respond in such a way would send a message to the students that not knowing is unacceptable. A useful quote to remember is, “the three most important words in medical education are ‘I don’t know’” [1].

When providing feedback on performances in the clinical (or simulation) setting, make it a two-way conversation. Ask students for their opinion before giving your own and include aspects of performance that were done well and areas that need more work. Help students develop a plan for addressing the areas that need more attention.

Challenging and engaging learning environments

Students who are challenged by the teacher are likely to progress their learning more rapidly. A challenging learning environment is one where students are encouraged to think about and do things in new ways. Assumptions are challenged and new skills are developed. Students value these kinds of learning activities. It is important to emphasize the difference between a challenging learning environment and an intimidating learning environment. In fact, a safe and supportive learning environment is a prerequisite for challenging students. When students feel safe and supported they are open to being challenged, when they are challenged they will be more inclined to engage in the process.

Another important facet to effective teaching is the use of engaging learning activities, which require students to exercise their brain, mouth or hands, not just their ears. Try to avoid activities where students are simply passive recipients of information. The more active the activity, the more likely it is to impact on the students learning.

Experiential learning activities such as interviewing a patient, practising a procedural skill in a workshop and role play are usually very engaging simply by virtue of the fact that they require students to do things. Small group work such as PBL also tends to be engaging because of the collaborative nature of the activity, the tendency of the case to generate questions in the minds of the learners and the need to solve problems.

It can be challenging to deliver lectures that are engaging. The following strategies may help:

• try to be interactive;
• pose questions to the students;
• have students discuss an issue or share their experience in pairs;
• tell a story to illustrate a point;
• use case examples or problems that students can easily relate to as the starting point for the lecture;
• relate theoretical concepts to concrete examples;
• have students critique a video, case, statement, solution or problem.

Activities such as observing a hospital activity, reading an article or observing an invasive procedure can be made more engaging if students have a task to complete as part of the
process. Ideally, the task would help develop critical reflection skills. For example, if students are required to attend morbidity and mortality meetings, they could have some pre-set questions to address based on their observations.

**Teaching styles**

Individual educators tend to adopt a preferred style of teaching if the option exists [2]. The preferred style is likely to be determined by a combination of the teacher’s beliefs about what works best, their aptitudes and what they feel most comfortable with.

Styles can range from teacher-led where the teacher adopts the expert role and presents information to the learners via a lecture or demonstrates how to do something via role modelling, to student centred where the teacher may simply facilitate students to learn for themselves and from peers—for example, PBL or small group project work. Teachers who adopt the student centred approach may see their role as a motivator and guide for students as they work through a learning activity. The teacher’s skills may be in formulating engaging learning activities, facilitating group discussion, asking thought provoking questions and/or providing effective feedback.

Each teaching style has advantages and disadvantages, which will vary with the content to be taught, the number of students, the students’ preferred learning styles (if known), the teacher’s abilities and the time and resources available for the teaching session. Advantages of student-centred styles include the encouragement of collaboration, communication and proactive group problem solving skills among students: all useful experiences for being an effective team member in the workplace. It is helpful to be aware not only of your preferred teaching style, but also to be aware of other ways of teaching that may be equally or more effective in particular circumstances. The ability to be flexible is encouraged. It may be that you will need to adjust your usual methods to fit in with the overall curriculum delivery design at your school.

Harden identifies six important roles of the teacher: [3]

- information provider;
- role model;
- facilitator;
- assessor;
- planner;
- resource producer.

As an information provider in the field of patient safety, it is important to be well informed about it. This requires knowledge of basic patient safety principles, why it is important in the clinical setting and what staff can do to promote patient safety in the workplace. Spending time reflecting on one’s own practice and approaches to hazards in the workplace will help identify relevant teaching points for your students. There are many ways a clinical teacher can role model safe practice. When you are in the clinical setting with patients, students will notice how you:

- interact with patients and families;
- respect the wishes of patients and families;
- inform patients and families of risks;
- consider risk–benefit ratios in determining management plans;
- respond to and invite questions from patients and families;
- wash your hands between patients;
- adopt a team approach;
- welcome advice from colleagues;
- adhere to workplace protocols;
- acknowledge uncertainty;
- acknowledge and learn from your own and others’ errors [4];
- problem solve systems issues;
- look after yourself and your colleagues.
You can be a very effective patient safety teacher simply by being a safe practitioner yourself in the presence of students who are eager to learn.

**Considering the patient in patient safety learning**

Patient safety education can be incorporated into many different educational settings from the clinical environment to the lecture theatre and PBL tutorial room simply by being mindful of where the learning opportunities are. The following half questions may give you ideas about how to create a patient safety learning moment:

- What are the hazards for the patient here…
- What do we need to be mindful of in this situation…
- How can we minimize the risks…
- What would make this situation more risky for the patient…
- What should we do if X should occur…
- What will be our plan B…
- What would we say to the patient if X occurred…
- What are our responsibilities…
- Who else can help with this situation…nursing staff? Patient?
- What happened? How can we prevent this in the future….
- What can we learn from this situation…
- Let’s look at the risk–benefit ratio of your suggested plan…

Some of the best teaching students will experience comes from patients themselves. Their role in medical education has a long history, usually in relation to describing their experience of a disease or illness. However, they can also teach students about communication, risk communication, ethics, responses to adverse events and more.

**A cautionary note**

Remember that students may become demoralized if there is undue emphasis on risk, errors and patient harm. An effective patient safety teacher will be able to balance this by addressing the positive aspects of the area such as solutions to problems, progress in patient safety and equipping students with concrete strategies to improve their practice. It is also important to remind students of the success of the majority of patient care episodes. Patient safety is about making care even better.

**Resource material**

- National Center for Patient Safety of the US Department of Veterans Affairs ([www.patientsafety.gov](http://www.patientsafety.gov))

*ABC of learning and teaching in medicine* Edited by Peter Cantillon, Linda Hutchinson and Diana Wood, British Medical Journal Publishing Group, 2003.([http://hsc.unm.edu/som/ted/mes/British%20Medical%20Journal%20series%20on%20Medical%20Education.htm](http://hsc.unm.edu/som/ted/mes/British%20Medical%20Journal%20series%20on%20Medical%20Education.htm))


7. Educational principles essential for patient safety teaching and learning

References


The purposes of assessment
Assessment is an integral part of any curriculum. The content and format of assessment procedures strongly influence the study behaviour and learning outcomes of the students. It is essential that assessments used in the patient safety curriculum support the exit learning outcome objectives as well as providing appropriate motivation and direction for the students. Assessments should be meaningful and give confidence to teachers, course planners and external stakeholders such as accreditation bodies, standards boards and the future employers of our students. WHO recommends that guidelines such as the international best practice in developing assessment guidelines are considered when assessing elements in medical curricula.

Formative assessments
Formative assessments are a vital and inherent part of the learning process for students. A wide range of such activities is possible within all components of a medical programme. Self-assessment is the ability of students to assess their own learning needs and choose educational activities that meet these needs. (The preponderance of evidence suggests that students have a limited ability to accurately self-assess and may need to focus more on external assessment.)

Summative assessment
All components of assessment that the students have to pass, or have to complete before progression from one part of the course to another may occur, are regarded as summative. In general terms, they fall into two types of assessment: end-of-course examinations and in-course assessments.

End-of-course summative assessments
Such assessments can typically be at the end of an eight-week block, end of term, end of year or end of programme. The bulk of this chapter covers the requirements of end-of-course assessments.

In-course summative assessments
There is a range of course assessments that can easily be introduced in the patient safety curriculum. Many schools could incorporate these elements into existing portfolios or the “record of achievement”.

Some features of “best assessment” practices in patient safety
The following assessment principles will apply to achieving the aims of patient safety curriculum. The assessments should:
- drive learning in the intended direction of meeting the exit learning outcomes of a newly graduated doctor capable of safe patient care;
- have a strong formative element, with regular opportunities for remediation and counselling throughout the course;
- be integrated with, for example, clinical competence and not be discipline based;
- be included in examinations of clinical competence and professional behaviours in all stages of the course;
- be included in examinations of basic sciences, e.g. integrated in population health sciences at all stages of the course;
- be progressive and ensure proportions of material from previous stages will be included in all subsequent exams;
- be developed with the expectation that they will meet quality assurance standards;
- claim fairness by engaging students and staff in the process of development;
- be motivating and provide direction for what students need to learn to practise safely;
- be feasible and acceptable to both faculty and students;
- conform to the “house style” to add to the professional appearance of the procedures.
Defining what is to be tested

Blueprinting
Students internationally are concerned about the amount of material in the curriculum that they have to learn, and are made anxious by not knowing what might be assessed. Blueprinting is a way of defining the range of competencies (or knowledge) to be tested. These will be drawn directly from the learning outcomes of the curriculum. It is important to ensure that the planned assessment adequately samples the range of competencies by the end of the medical degree.

Some competencies need to be systematically assessed to ensure that students build on their knowledge and integrate into their clinical practice. To create a blueprint, the dimensions of the grid are created to cover the expected competencies. One should ensure there is even weighting of the components being assessed and, therefore, adequate sampling of the material. For example, Table 4 shows different components of patient safety that might be assessed in end-of-year assessments throughout the five years of an undergraduate medical degree.

Table 4. A blueprint showing end-of-course assessments for components of the patient safety curriculum

<table>
<thead>
<tr>
<th>Assessable learning outcomes</th>
<th>Year that curriculum modules are first assessed in a typical programme</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Year 1</td>
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<tr>
<td>Health law</td>
<td>X</td>
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<tr>
<td>Health-care systems</td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td></td>
</tr>
<tr>
<td>Safe patient care</td>
<td></td>
</tr>
<tr>
<td>Quality improvement</td>
<td></td>
</tr>
</tbody>
</table>

Select appropriate test methods
It is important to emphasize that assessment in patient safety is aligned with the agreed learning outcomes. It is unlikely that any particular assessment format is suitable to assess everything required. It is best to be aware of the range of assessment methods and make a decision based on an understanding of their strengths and limitations. Let the purpose of the assessment, for example, “to assess knowledge of health-care law in the unconscious patient” drive the choice of format, in this case a modified essay question (MEQ) or a multiple choice question (MCQ).

Quality improvement methods may be best assessed via a student project. There are a number of basic concepts in assessment to help decide which type of assessment format is most appropriate. One of the most well known of these is Miller’s triangle, which suggests that a student’s performance is made up of four levels (see Figure 2):

- knows
- knows how
- shows how
- does.

For example, “showing how” is related to specific competencies that are appropriate for the level of expertise of the student. These can be examined by, for example, an objective structured clinical examination (OSCE) station.
Again, looking at Figure 2, one can see that knowledge (knows) can be tested by MCQs, for example.

Typical assessment formats within a medical school might include:

**Written:**
- multiple choice items (1 from 4/5);
- extended matching questions (EMQ);
- structured short answer questions;
- modified essay question (MEQ);
- extended written work (e.g. project reports, posters);
- portfolio/log books.

**Clinical/practical:**
- multiple station exams;
- direct observation of performance (e.g. observed long cases, mini clinical evaluation exercise [Mini-CEX]);
- 360 degree or multisource feedback (MSF);
- structured reports (e.g. attachment assessments);
- oral presentations (e.g. projects, case-based discussion);
- structured oral exams.

There are some strengths and weaknesses with all of these formats and which need to be considered when choosing the right assessment for a particular learning outcome within a patient safety curriculum.

**Written**

Multiple choice question/extended matching question

MCQ and EMQ are very attractive formats in that they can test a wide sample of the curriculum, can be machine marked and give reliable scores of a student’s ability. However, their main drawback in testing aspects of clinical competence, such as patient safety, is that they tend to test knowledge only. This is appropriate with, for example, health-care law and aspects of patient safety in public health. It is not appropriate in testing, for example, ethical reasoning. An example of an MCQ is given in Appendix 2. The EMQ has been designed to address the issue of guessing in multiple choice exams.

**Modified essay questions/key feature**

The traditional essay is used in some places. There is great advantage in allowing students to evidence their critical thinking, reasoning and problem solving skills. However, marking essays for large classes are resource intensive and subject to much variability in judges marks. However, MEQs or key feature formats are designed to be answered in 5–10 minutes, and encourage short note responses to appropriate scenarios. Providing a model answer and marking scheme helps examiners maintain some standardization. Several MEQs on a range of different subjects can be asked in the time it takes to write one essay sampling just one area of the curriculum. An example is given in Appendix 2.
8. How to assess patient safety

Portfolio/logbook
A spectrum of assessment methods to evidence with respect to key learning outcomes, ranging from a log of clinical activities, through a record of achievements throughout a segment of the programme, to documentation supporting an annual appraisal, complete with learning plans. A particularly useful component of the portfolio is the critical incident. Here students are asked to reflect in a structured way on clinical situations they have observed where patient safety was an issue.

Clinical/practical
There is a wealth of research evidence to suggest that having more than one observer improves the accuracy of competency assessments. It is very important that considerations of patient safety are incorporated within the marking rubrics, examiner training and feedback sessions of each of the assessments that is used in the medical school context. If the topic is assessed separately, it will drive students to learn patient safety as something extra to be added on, rather than as an integral part of safe patient care.

Objective structured clinical examination (OSCE)
OSCE comprises of a circuit of short simulated clinical cases assessed either by a standardized patient or the clinical teacher. Patient safety can be incorporated as at least one item within the checklist for each simulated scenario. Alternatively, a single case can be entirely dedicated to a patient safety case—e.g. communicating an adverse event to a simulated patient recovering from routine abdominal surgery. Cases in which the student is required to look at treatment charts, X-rays or investigations are sometimes called static stations as they do not require the student to be observed. This allows, for example, prescribing errors to be simulated and the students actions recorded. An example is given in Appendix 2.

Multisource feedback (MSF)
MSF are collated views from a range of healthcare workers or peers about the student in the clinical learning environment. Ideally, checklist items about safe patient care and good communication would be included in the rating form.

Mini clinical evaluation exercise (mini-CEX)
A mini-CEX is where the supervisor observes a student performing a history, examination or communication exercise on a real patient and rates the student on several domains. Aggregated scores of several encounters are used to determine the competency of the student. Once again, it is important to ensure that elements of patient safety are included on the rating form. It is particularly important in a mini-CEX to have good preparation of clinical raters and ensuring that trainers of supervisors include references to patient safety in the training sessions.

End of clinical placement assessments/global rating scales
This assessment aims to give a credible view of a student’s progress and is usually completed by the supervisor, based on personal knowledge or after consultation with colleagues. Patient safety criteria need to be included.

Case-based discussion (CBD)
The CBD is a structured discussion of clinical cases by the supervisor focusing on clinical reasoning and decision-making. It takes real cases in which the student has been involved. This is a relatively underexplored technique for examining the understanding of patient safety issues as related to real cases.
Matching assessment to expected learning outcomes

It is always important to match assessments to intended learning outcomes. Most medical curricula will have learning outcomes, some more detailed than others. In Table 5, the complete list of learning outcomes for patient safety can be easily matched with appropriate assessments.

A sample of patient safety outcomes have been modified from the Australian Junior Doctor Curriculum Framework. The Framework has been aligned with many sources, including the Australian Patient Safety Education Framework, and shows that patient safety concepts are completely integrated.

Table 5. Sample of typical end of medical programme learning outcomes for patient safety showing typical assessment formats

<table>
<thead>
<tr>
<th>Competencies</th>
<th>Assessment format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safe patient care: systems</td>
<td></td>
</tr>
<tr>
<td>Understand the complex interaction between the health-care environment, doctor and patient</td>
<td>Essay</td>
</tr>
<tr>
<td>Aware of mechanisms that minimize error, e.g. checklists, clinical pathways</td>
<td></td>
</tr>
<tr>
<td>Safe patient care: risk and prevention</td>
<td></td>
</tr>
<tr>
<td>Know the main sources of error and risk in the clinical workplace</td>
<td>Essay/MEQ</td>
</tr>
<tr>
<td>Understand how personal limitations contribute to risk</td>
<td>Viva/Portfolio</td>
</tr>
<tr>
<td>Promote risk awareness in the workplace by identifying and reporting potential risks to patients and staff</td>
<td>Portfolio</td>
</tr>
<tr>
<td>Safe patient care: adverse events and near misses</td>
<td></td>
</tr>
<tr>
<td>Understand the harm caused by errors and system failures</td>
<td>Essay/MEQ</td>
</tr>
<tr>
<td>Aware of principles of reporting adverse events in accordance with local incident reporting systems</td>
<td>MEQ</td>
</tr>
<tr>
<td>Understand principles of the management of adverse events and near misses</td>
<td>MEQ</td>
</tr>
<tr>
<td>Safe patient care: public health</td>
<td></td>
</tr>
<tr>
<td>Understand the key health issues of your community</td>
<td>MCQ</td>
</tr>
<tr>
<td>Aware of procedures for informing authorities of “notifiable diseases”</td>
<td>MCQ</td>
</tr>
<tr>
<td>Understand principles disease outbreak management</td>
<td>MEQ</td>
</tr>
<tr>
<td>Safe patient care: infection control</td>
<td></td>
</tr>
<tr>
<td>Understand prudent antibiotic/antiviral selection</td>
<td>MCQ</td>
</tr>
<tr>
<td>Practise correct handwashing and aseptic techniques</td>
<td>OSCE</td>
</tr>
<tr>
<td>Always use methods to minimize transmission of infection between patients</td>
<td>OSCE</td>
</tr>
<tr>
<td>Safe patient care: radiation safety</td>
<td></td>
</tr>
<tr>
<td>Know the risks associated with exposure to radiological investigations and procedures</td>
<td>MCQ/MEQ</td>
</tr>
<tr>
<td>Know how to order radiological investigations and procedures appropriately</td>
<td>MEQ</td>
</tr>
<tr>
<td>Safe patient care: medication safety</td>
<td></td>
</tr>
<tr>
<td>Know the medications most commonly involved in prescribing and administration errors</td>
<td>MCQ</td>
</tr>
<tr>
<td>Know how to prescribe and administer medications safely</td>
<td>OSCE</td>
</tr>
<tr>
<td>Know the procedures for reporting medication errors and near misses in accordance with local requirements</td>
<td>Portfolio</td>
</tr>
</tbody>
</table>
8. How to assess patient safety

<table>
<thead>
<tr>
<th>Communication</th>
<th>Assessment format</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Patient interaction: context</strong></td>
<td></td>
</tr>
<tr>
<td>Understand the impact of the environment on communication, e.g. privacy, location</td>
<td>MEQ</td>
</tr>
<tr>
<td>Use good communication and know its role in effective health-care relationships</td>
<td>OSCE</td>
</tr>
<tr>
<td>Develop strategies to deal with the difficult or vulnerable patient</td>
<td>OSCE</td>
</tr>
<tr>
<td><strong>Patient interaction: respect</strong></td>
<td></td>
</tr>
<tr>
<td>Treat patients courteously and respectfully showing awareness and sensitivity to different backgrounds</td>
<td>OSCE/mini-CEX</td>
</tr>
<tr>
<td>Maintain privacy and confidentiality</td>
<td></td>
</tr>
<tr>
<td>Provide clear and honest information to patients and respect their treatment choices</td>
<td>OSCE/mini-CEX</td>
</tr>
<tr>
<td><strong>Patient interaction: providing information</strong></td>
<td></td>
</tr>
<tr>
<td>Understand the principles of good communication</td>
<td>OSCE/mini-CEX/MSF</td>
</tr>
<tr>
<td>Communicate with patients and carers in ways they understand</td>
<td>OSCE</td>
</tr>
<tr>
<td>Involve patients in discussions about their care</td>
<td>Portfolio</td>
</tr>
<tr>
<td><strong>Patient interaction: meetings with families or carers</strong></td>
<td></td>
</tr>
<tr>
<td>Understand the impact of family dynamics on effective communication</td>
<td>Portfolio</td>
</tr>
<tr>
<td>Ensure relevant family/carers are included appropriately in meetings and decision-making</td>
<td>Portfolio</td>
</tr>
<tr>
<td>Respect the role of families in patient health care</td>
<td>MEQ/portfolio</td>
</tr>
<tr>
<td><strong>Patient interaction: breaking bad news</strong></td>
<td></td>
</tr>
<tr>
<td>Understand loss and bereavement</td>
<td>MEQ</td>
</tr>
<tr>
<td>Participate in breaking bad news to patients and carers</td>
<td>OSCE</td>
</tr>
<tr>
<td>Show empathy and compassion</td>
<td>OSCE</td>
</tr>
<tr>
<td><strong>Patient interaction: open disclosure</strong></td>
<td></td>
</tr>
<tr>
<td>Understand the principles of open disclosure</td>
<td>MEQ</td>
</tr>
<tr>
<td>Ensure patients are supported and cared for after an adverse event</td>
<td>OSCE</td>
</tr>
<tr>
<td>Show understanding to patients following adverse events</td>
<td>OSCE</td>
</tr>
<tr>
<td><strong>Patient interaction: complaints</strong></td>
<td></td>
</tr>
<tr>
<td>Understand the factors likely to lead to complaints</td>
<td>MEQ/portfolio</td>
</tr>
<tr>
<td>Respond appropriately to complaints using the local procedures</td>
<td>OSCE</td>
</tr>
<tr>
<td>Adopt behaviours to prevent complaints</td>
<td>OSCE</td>
</tr>
</tbody>
</table>
8. How to assess patient safety

**Resource material**


**Case-based discussion**


**Mini clinical evaluation exercise**


**Multisource feedback**


**Multiple choice questions**

**Objective structured clinical examination**

**Portfolios**
9. How to evaluate patient safety curricula

**Introduction**

In this section we have summarised some general principles of evaluation. Following the publication of this document, WHO plans to make available standard evaluation tools for this curriculum.

As individuals, we engage in evaluation every day: what to eat, what clothes to wear, how good that movie was. Evaluation is an important component of any curriculum, and should be included in your strategy for implementing patient safety curricula at your institution or in your hospital/classroom. It can be as simple as having students complete a questionnaire after exposure to a patient safety session to see what they thought, or as complex as a faculty-wide review of the entire curriculum, which may involve surveys and focus groups with students and staff, observation of teaching sessions and other evaluation methods.

Evaluation involves three main steps:
- developing an evaluation plan;
- collecting and analysing information;
- disseminating the findings to appropriate stakeholders for action.

**How evaluation differs from assessment**

Information on assessment and evaluation can be confusing due to the fact that some countries use the two terms interchangeably. The easiest way to remember the difference between assessment and evaluation is that assessment is about measuring student performance, while evaluation is about examining how and what we teach. In assessment, data are collected from a single source (the student), whereas in evaluation, data may be collected from a number of sources (students, patients, teachers and/or other stakeholders).

**Step 1: Developing an evaluation plan**

**What is being evaluated?**

A fundamental first step in developing an evaluation plan is identifying the evaluation object: is it a single patient safety session? Is it the entire curriculum? Are we evaluating the faculty’s capacity for implementation? Are we evaluating teacher performance/effectiveness? Objects for evaluation can be classified either as policy, programme, product or individual [1]—and all can be applied in the educational setting.

**Who are the stakeholders?**

There are often many stakeholders involved in the evaluation of patient safety education. However, it is important to identify a primary audience as this will impact the question(s) you want your evaluation to answer. The primary audience may be the university, the faculty, hospital administration, teachers, students or patients/the public. For example, you may be the primary stakeholder if you are a teacher wanting to know how your students are responding to the introduction of patient safety education in your course.

**What is the purpose of the evaluation?**

After identifying the primary audience/stakeholder(s), the next thing to decide is what you are trying to achieve from the evaluation. What question(s) are you trying to answer? These may differ depending on your role in patient safety education. Table 6 gives examples of the kinds of questions that might be asked depending on the primary stakeholder.
What form(s) of evaluation is/are most appropriate?
Evaluation types or forms can be categorized as follows: proactive, clarificative, interactive, monitoring and impact [2]. The forms differ in terms of primary purpose of the evaluation, the stage of programme/curriculum implementation you are at, the kinds of questions you are asking and the key approaches required. Table 7 provides a summary of each form of evaluation.

Table 6: Examples of stakeholder questions

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Possible questions for evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital administrators/clinical staff</td>
<td>Does teaching patient safety to interns result in a decreased number of adverse events?</td>
</tr>
<tr>
<td>University faculty</td>
<td>How can this patient safety curriculum best be implemented in our institution?</td>
</tr>
<tr>
<td>Individual teachers</td>
<td>Am I delivering the curriculum effectively? Are students enjoying it? Are they learning?</td>
</tr>
</tbody>
</table>

Table 7: Forms of evaluation (adapted from Owen [1])

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Proactive</th>
<th>Clarificative</th>
<th>Interactive</th>
<th>Monitoring</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orientation</td>
<td>Synthesis</td>
<td>Clarification</td>
<td>Improvement</td>
<td>Justification; fine tuning</td>
<td>Justification; accountability</td>
</tr>
<tr>
<td>Major focus</td>
<td>Context for curriculum</td>
<td>All elements</td>
<td>Delivery</td>
<td>Delivery; outcomes</td>
<td>Delivery; outcomes</td>
</tr>
<tr>
<td>State of programme/curriculum</td>
<td>None (not yet implemented)</td>
<td>Development phase</td>
<td>Development phase</td>
<td>Settled; implemented</td>
<td>Settled; implemented</td>
</tr>
<tr>
<td>Timing relative to implementation</td>
<td>Before</td>
<td>During</td>
<td>During</td>
<td>During</td>
<td>After</td>
</tr>
<tr>
<td>Gathering evidence</td>
<td>Review of documents, databases</td>
<td>Site visits</td>
<td>Focus groups, nominal group technique, Delphi technique for needs assessment</td>
<td>Combination of document analysis, interview and observation</td>
<td>Findings include programme plan and implications for organization. Can lead to improved morale</td>
</tr>
</tbody>
</table>
9. How to evaluate patient safety curricula

Table 7 (Continued): Forms of evaluation (adapted from Owen [1])

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Proactive</th>
<th>Clarificative</th>
<th>Interactive</th>
<th>Monitoring</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Types of questions</td>
<td></td>
<td>- What are the intended outcomes and how is the programme designed to achieve them? - What is the underlying rationale for the programme? - What elements need to be modified to maximize intended outcomes? - Is the programme plausible? - Which aspects of the programme are amenable to subsequent monitoring or impact evaluation?</td>
<td>- What is the programme trying to achieve? - How is it going? - Is the delivery working? - Is delivery consistent with the programme plan? - How could delivery be changed to make it more effective? - How could this organization be changed to make it more effective?</td>
<td>- Is the programme reaching the target population? - Is implementation meeting stated objectives and benchmarks? - How is implementation going between sites? - How is implementation now compared to a month/6 months/1 year ago? - Are our costs rising or falling? - How can we finetune the programme to make it more efficient? More effective? - Are there any programme sites that need attention to ensure more effective delivery?</td>
<td>- Has the programme been implemented as planned? - Have the stated goals been achieved? - Have the needs of students, teachers and others served by the programme been achieved? - What are the unintended outcomes? - How do differences in implementation affect programme outcomes? - Is the programme more effective for some participants than for others? - Has the programme been cost-effective?</td>
</tr>
</tbody>
</table>
Step 2: Collecting and analysing information

Collection
There are a number of data sources and collection methods to consider in an evaluation of patient safety curricula or any other evaluation object. How many and which ones you use depends on your evaluation’s purpose, form, scope and scale. Potential data sources include:

- students (prospective, current, past, withdrawn);
- self (engaging in self-reflection);
- colleagues (teaching partners, tutors, teachers external to the course);
- discipline/instructional design experts;
- professional development staff;
- graduates and employers (e.g. hospitals);
- documents and records (e.g. teaching materials, assessment records).

Data may be collected from the above listed sources in a variety of ways, including self-reflection, questionnaires, focus groups, individual interviews, observation and documents/records.

Self-reflection
Self-reflection is an important activity for a medical or clinical educator and has an important role in evaluation. An effective method for reflection involves:

- writing down your experience of teaching (in this case, patient safety education) or feedback received from others;
- describing how you felt and whether you were surprised by those feelings;
- re-evaluating your experience in the context of assumptions made: [3]
  - Were they good assumptions? Why, or why not?

Engaging in self-reflection will allow for the development of new perspectives and a greater commitment to action in terms of improving or enhancing curriculum and/or teaching.

Questionnaires
Questionnaires are easily the most common method of data collection, providing information on people’s knowledge, beliefs, attitudes and behaviour [4]. If you are interested in research, and publishing the evaluation results, it may be important to use a previously validated and published questionnaire. This will save you both time and resources, and will allow you to compare your results with those from other studies using the same instrument. It is always useful as a first step to search the literature for any such tools that may already be in existence.

More often than not, however, teachers/faculties/universities choose to develop questionnaires for their own individual use. Questionnaires may be comprised of open- and/or closed-ended questions and can take a variety of formats such as tick-box categories, rating scales or free text. Good questionnaire design is integral to the collection of quality data, and much has been written about the importance of layout and how to construct appropriate items [3-5]. You may wish to consult one of the references or resources provided prior to developing your questionnaire for evaluation of patient safety teaching or curricula.

Focus groups
Focus groups are useful as an exploratory method and means of eliciting student or tutor perspectives [6]. They often provide more in-depth information than questionnaires and allow for more flexible, interactive exploration of attitudes towards and experiences of curriculum change. They can be used in conjunction with questionnaires or other data collection methods as a means of checking or triangulating data, and can vary in terms of structure and delivery from the conversational and flexible to the strictly regimented and formal. Depending on resources
Individual interviews

Individual interviews provide the opportunity for more in-depth exploration of one’s attitudes towards potential curriculum change and experiences with the curriculum once it has been implemented. As with focus groups, they can be unstructured, semi-structured or structured in format. Although individual interviews provide information on a narrower range of experience than focus groups, they also allow the interviewer to explore more deeply the views and experiences of a particular individual. One-on-one interviews may be a useful method for obtaining evaluation data from colleagues or faculty leaders/administrators.

Observation

For some forms of evaluation it may be useful to conduct observations of patient safety educational sessions to obtain an in-depth understanding of how material is being delivered and/or received. Observations should involve the use of a schedule to provide a framework for observations. The schedule can be relatively unstructured (e.g. a simple notes sheet) or highly structured (e.g. the observer rates the object of evaluation on a variety of pre-determined dimensions and makes comments on each).

Documents/records

As part of your evaluation, you may also wish to examine documental or statistical information such as teaching materials used or student performance data gathered. Other information such as hospital data on adverse events may also be useful, depending on your evaluation question(s).

Analysis

Your data collection may involve just one of the above or other methods, or it may involve several. In either case, there are three interconnected elements to consider in terms of data analysis [1]:

- data display—organizing and assembling information collected in a meaningful way;
- data reduction—simplifying and transforming the raw information into a more workable or usable form;
- conclusion drawing—constructing meaning from the data with respect to your evaluation question(s).

Step 3: Disseminating findings and taking action

All too often the conclusions and recommendations of evaluations are not acted upon—the first step in avoiding this is ensuring that this valuable information is fed back in a meaningful way to all relevant stakeholders. If the evaluation is on the quality of patient safety teaching, then results (e.g. from student questionnaires, peer-observed teaching sessions) must be relayed to and discussed not only with administration, but also with the teachers. Brinko [7] provided an excellent review of best practice on the process of giving feedback be it for students or colleagues. It is important that any feedback is received in a way that encourages growth or improvement. If the evaluation focuses on effectiveness of the patient safety curriculum, any conclusions and recommendations for improvement must be communicated to all who had a hand in implementing the curriculum (e.g. at the institution, faculty, teacher and student levels). The format for dissemination must be meaningful and relevant. Effective communication of evaluation outcomes, findings and recommendations is a key catalyst for improvements in patient safety teaching and curriculum design.
Resources
You may find the following resources useful for various stages of your evaluation planning and implementation:


References
10. Web-based tools and resources

Each topic has a set of tools that have been selected from the World Wide Web and designed to assist health practitioners improve the care delivered to patients. We have only included tools that are freely available on the Internet. All of the sites were accessible as of May 2008.

Included in the list are examples of guidelines, checklists, web sites, databases, reports and fact sheets and an outcome focused quality improvement initiative designed to assist health-care teams, professionals and administrators implement a patient safety activity or lead an organization towards a safety culture.

Very few of the tools have been through a rigorous validation process. Most measures in quality tend to be about processes of care and quality that apply to small groups of patients in highly contextualized environments [1] such as an ICU or a ward in a rehabilitation unit.

Most patient safety initiatives require health professionals to measure the steps they take in the delivery care process. This is because one will not be able to tell if the planned changes made any difference to patient care or the outcome. Focusing on measurement has been a necessary and important step in teaching patient safety; if you do not measure, how do you know that an improvement has been made? Even though students will not be expected to measure their clinical outcomes by the time they graduate, they should be familiar with the plan-do-study-act (PDSA) cycle that forms the basis of measurement. Many of the tools on the Internet are based on the PDSA cycle.

Reference
11. Activities to assist patient safety understanding

Introduction
Medical students and junior doctors are accustomed to learning new information by studying and then working hard to apply their new knowledge and skills in patient care. In the case of patient safety, just “trying harder” will not work [1]. Hence, a great deal of thought needs to be given to the timing and format of educational delivery.

The purpose of this chapter is to outline the various strategies that can be used to assist patient safety understanding. These are the same as the variety of teaching strategies that are used for teaching other aspects of medicine. The challenge for the educator is to see if patient safety elements can be incorporated into existing teaching and learning activities. If so, it avoids patient safety topics being seen as an “add on”—and hence extra work—rather than simply being part of a holistic approach to clinical education.

A fundamental principle, in keeping with the principles of effective teaching, is that opportunities for “active learning” should be maximized, during which the learners engage with the learning process in a meaningful fashion, rather than being passive recipients of information.

Active learning can be summarized with the following statement: [2]

Don’t tell students when you can show them, and don’t show them when they can do it themselves.

Lowman has outlined some teaching strategies for increasing the effectiveness of active learning, including: [3]

- use information that is of interest to learners and involves real-life events;
- present dramatic or provocative material;
- reward learners;
- tie themes together with as many topics as possible;
- activate prior knowledge using pretests and concept maps and gathering background information;
- challenge learners by presenting topics that are more difficult from time to time;
- demonstrate the behaviours you are seeking to promote.

Lectures [4]
In a lecture, the teacher presents a topic to a large group of students. This traditionally occurs in a face-to-face setting; however, recently some universities give students the option of viewing the lecture online via pod-casting.

Lectures should have both:

- aims—indicating the general theme of the lecture, e.g. the aim of this lecture is to introduce you to the topic of patient safety;
- objectives—relating directly to the learning and that should be achievable by the end of the lecture, e.g. by the end of this lecture you will be able to list three major studies that highlight the extent of harm caused by healthcare delivery.

Lectures should last about 45 minutes, as concentration falls after this time. It is, therefore, important that they do not contain too much material—aim for four or five key points at the most.

Lectures are often structured as follows, with three principal elements (set, body, close):

- the set, or introduction, is the initial period of the lecture when the lecturer explains why the topic is important and outlines the objectives of the session;
- the body is the main content part of the lecture;
- the conclusion should revisit the objectives and the key points of the presentation.
Benefits:
- able to convey information to large numbers of students at one time;
- useful for providing an overview of broad topics, to impart factual information and introduce theoretical concepts;
- provide up-to-date information and ideas that are not easily accessible in texts or papers;
- can explain or elaborate on difficult concepts and ideas and how these should be addressed.

Challenges:
- keeping large numbers of students actively engaged;
- junior staff generally prefer more experiential techniques;
- presentation skills;
- usually there is some dependence on technology;
- content (medical harm) can be discouraging.

Examples:
- introduction to patient safety;
- introduction to human factors.

Learning on the run during clinical placements
Teaching that occurs in the context of ward rounds or in bedside teaching sessions.

Benefits:
- ward-based teaching provides one of the best opportunities to teach and observe history and examination skills as well as communication and interpersonal skills—the teacher can also role model safe, ethical, professional practice;
- patient safety issues are everywhere in the clinical environment;
- contextualized;
- real—hence highly relevant;
- interesting and often challenging.

Challenges:
- lack of time due to work pressures;
- lack of knowledge of how to incorporate patient safety topics into bedside teaching;
- opportunistic—not possible to prepare and difficult to deliver a uniform curriculum.

Examples:
- hand hygiene issues on the ward;
- patient identification processes.

Resource:
Teaching on the run series

Small group activities—learning with others
Learning done in the setting of a small group, usually with a tutor. The main feature is student participation and interactivity, used in relation to a particular problem, with more onus on the students to be responsible for own learning, e.g. PBL, project work.

Benefits:
- sharing own stories;
- learning from peers;
- multiple perspectives;
- learning teamwork and communication skills.

Challenges:
- group dynamics;
- resource implications in terms of tutor time;
- expertise of the tutor.

Examples:
- human factors considerations of commonly used clinical equipment;
- teamwork in the clinical environment.
11. Activities to assist patient safety understanding

**Resources:**
University of Colorado, Denver, Health Sciences Programme  
http://www.uchsc.edu/CIS/SmGpChkList.html.  
Scottish Council for Postgraduate Dental and Medical Education  

**Case discussion**
A group of students—often with a tutor—discuss a clinical case.

**Benefits:**
- can use an actual or made-up case to illustrate patient safety principles;  
- contextualized—makes concepts real and relevant;  
- learn to solve problems as they arise in the workplace;  
- enables linking of abstract concepts to the real situation.

**Challenges:**
- choosing/developing realistic cases that encourages students to become actively engaged in the discussion;  
- using the case effectively to challenge thinking and generate thoughtful learning;  
- encouraging students to generate the problem solving themselves.

**Resources:**
- incident analyses from parent hospital;  
- agency for health-care research and quality weekly morbidity and mortality cases;  
- http://webmm.ahrq.gov/

**Games**
Encompasses a spectrum from computer games to situational role play.

**Benefits:**
- fun, enjoyable;  
- challenging;  
- can illustrate teamwork, communication.

**Challenges:**
- relating the game to the workplace;  
- clearly defining the purpose of the game upfront.

**Resource:**
- Examples of teamwork generating games  
http://wilderdom.com/games/InitiativeGames.html

**Independent study**
Study undertaken by the student on their own, e.g. assignment work, essays.

**Benefits:**
- student can proceed at own pace;  
- student can focus on own knowledge gaps;  
- opportunity for reflection;  
- cheap, easy to schedule;  
- flexible for learner.

**Challenges:**
- motivation;  
- lack of exposure to multiple inputs;  
- may be less engaging;  
- marking the work and providing the feedback is time consuming for the teacher.

**Buddying a patient in hospital (patient tracking)**
A student follows the course of an individual patient throughout their hospital stay. Includes accompanying the patient for all investigations and procedures.

**Benefits:**
- includes the opportunity to learn about the health-care system;
see things from the patient’s perspectives;
see how different health-care areas interact together.

**Challenges:**
- time tabling;
- shaping the experience into a learning exercise;
- limited opportunity for students to:
  - share their learning;
  - get feedback from peers;
  - get assessed.

**Role play (docu-drama)**
One of the oldest known educational methods. Allows students to act out roles of health-care professionals in particular situations. These fall into two types:
- students improvise the dialogue and actions to fit a pre-determined scenario;
- students “act out” the roles and dialogue of a case study situation.

**Benefits:**
- cheap;
- requires little training;
- always available;
- interactive—enables learners to try on “what if” scenarios;
- experiential—introduces and sensitized learners to the roles that patients, their families and health-care practitioners and administrators play in patient safety situations;
- allows the learner to adopt a more senior role, or the role of a patient;
- can demonstrate different perspectives;
- ideal for exploring factors in association with interprofessional teamwork and communication in the prevention of patient safety errors.

**Challenges:**
- writing the scripts;
- developing sufficiently meaningful situations that allow for choices, decisions, conflicts;
- time consuming;
- not all students are involved (some only get to watch);
- students can get off the topic and the role play fizzles out.

**Resource:**

**Simulation**
In the context of health care, simulation is defined as “an educational technique that allows interactive, and at times immersive activity by recreating all or part of a clinical experience without exposing patients to the associated risks” [5]. It is likely that in the future increased access to various forms of simulation training will emerge because of the increasing ethical imperative to avoid patient harm [6].

A number of different simulation modalities are available, including:
- screen-based computer simulators;
- low-tech models or mannequins used to practise simple physical manoeuvres;
- standardized patients (patient actors);
- sophisticated computerized (“realistic”) full-body patient mannequin simulators;
- virtual reality devices.

**Benefits:** [7]
- no risk to patients;
- many scenarios can be presented, including uncommon but critical situations in which a rapid response is needed;
- participants can see the results of their decisions and actions; errors can be allowed to...
occur and reach their conclusion (in real life a more capable clinician would have to intervene);
- identical scenarios can be presented to different clinicians or teams;
- the underlying causes of the situation are known;
- with mannequin-based simulators clinicians can use actual medical equipment, exposing limitations in the human–machine interface;
- with full recreations of actual clinical environments complete interpersonal interactions with other clinical staff can be explored and training on teamwork, leadership and communication provided;
- intensive and intrusive recording of the simulation session is feasible, including audiotaping and videotaping; there are no issues of patient confidentiality—the recordings can be preserved for research, performance assessment or accreditation.

Challenges:
- some modalities are very expensive;
- specialized expertise required for teaching and for upkeep of some of the training devices.

Resource:
Society for Simulation in Healthcare (www.ssih.org).

Improvement projects
Quality improvement is a continuous cycle of planning, implementing strategies, evaluating the effectiveness of these strategies and reflection to see what further improvements can be made. Quality improvement projects are typically described in terms of the PDSA cycle [8] as follows:
- plan—the change, based on perceived ability to improve a current process;
- do—implement the change;
- study—analyse the results of the change;
- act—what needs to happen next to continue the improvement process?

Benefits:
PDSA approaches encourage clinicians to develop and be actively engaged in strategies that they hope will lead to improvement. It also promotes evaluation of these changes once the strategies have been implemented. Therefore, this can be a very useful approach to have students involved at a ward or clinical unit level, ideally as part of a multidisciplinary team approach to patient safety. Most quality improvement projects by their very nature have a patient safety element to them.
- motivating
- empowering
- learn about change management
- learn to be proactive
- learn to problem solve.

Challenges:
- sustaining momentum and motivation
- time commitment.

Example:
- hand hygiene issues in a clinical environment.

Resources
AHRQ mortality and morbidity web site (http://www.webmm.ahrq.gov/).
References
Patient safety impacts on all countries
In 2002, WHO Member States agreed on a World Health Assembly resolution on patient safety because they saw the compelling evidence of the need to reduce the harm and suffering of patients and their families, and the economic benefits of improving patient safety. The extent of patient harm from their health care has been exposed by the publication of international studies from a number of countries including Australia, Canada, Denmark, New Zealand, the United Kingdom and the United States of America. The concerns of patient safety are international, and it is widely recognized that adverse events are considerably underreported. While the bulk of patient safety research might be done in Australia, the United Kingdom and the United States, patient safety advocates wish to see patient safety adopted in all countries around the world, not just those that have had the resources to study and publish their patient safety initiatives. This internationalization of patient safety requires novel approaches to the education of future doctors and health-care practitioners.

Globalization
The global movements of doctors in training have produced many opportunities for enhancing postgraduate medical education and training. The mobility of students and teachers, and the international interconnectedness of experts in curriculum design, instructional methods and assessment, married with local campus and clinical environments, have led to a concordance in what constitutes good medical education. There have been initiatives to attack the problems of variable standards across the world in the outputs of medical schools. The International Institute of Medical Educators has identified the Global Minimum Education Requirements with the express purpose of defining the minimum competencies that all physicians must have, regardless of where they receive their general medical education or training [1].

The World Federation of Medical Education has also published standards for international best practice in medical school accreditation.

There is evidence that developing countries that have invested heavily in future generations of health-care workers have seen their assets stripped by the predations of the health-care systems of richer developing nations during times of workforce shortages [2].

The globalization of health-care delivery has forced medical education to recognize the challenges of preparing medical students who are not only able to work in their country of training, but also work in other health-care systems. Harden [3] described a three-dimensional model of medical education based on the:

- student (local or international);
- teacher (local or international);
- curriculum (local, imported or international).

In the traditional approach to teaching and learning patient safety, local students and local teachers use a local curriculum. In the international medical graduate or overseas student model, students from one country pursue in another country a curriculum taught and developed by teachers in the latter. In the branch-campus model, students, usually local, have an imported curriculum taught jointly by international and local teachers.

A second important consideration in the internationalization of medical education is the affordability of e-learning technologies that allow a global interconnectivity where the provider of a teaching resource, the teacher of that resource and the student do not all have to be on campus, in a hospital or out in a community at the same time.

The old style of curriculum emphasizes the mobility of students, teachers and curriculum...
across the boundaries of two countries, by mutual agreement, with a high expectation that the country of practice would provide much of the training when the student graduates.

The new way is a transnational approach in which internationalization of patient safety education is integrated and embedded within a curriculum and involves collaboration between a number of schools in different countries. In this approach, the principles of patient safety are taught in the global context rather than the context of a single country.

This model offers a range of considerable challenges and opportunities for international collaboration in patient safety education. This Curriculum Guide serves as an excellent base in this regard. It is important that the standards of international medical education bodies, for example, the World Federation of Medical Education, are reviewed to ensure that the principles of patient safety are included. Similarly, a dialogue is held with national accrediting bodies of medical schools around the world to ensure that patient safety principles are included in their accreditation checklists.

At a more local level, it is important for countries to customize and adapt materials. A good example of a transnational approach to medical education is the experience with international virtual medical schools [4]. Here a number of international universities have collaborated to form a virtual medical school, dedicated to enhanced learning and teaching. This model could be adaptable to patient safety.

Common components of a transnational virtual patient safety curriculum could be:

- a virtual library that would provide access to up-to-date resources, tools and learning activities and access to international patient safety literature (for example, the topics included in this curriculum);
- a research section that would both facilitate and encourage international collaboration;
- a curriculum map that identifies common areas of global interest in patient safety—it is vital that staff and students are able to customize programmes to meet their local and individual needs;
- a collaboration section that includes online discussions among students from different countries who participate as part of a collaborative learning environment in an international community of learners; a place for teachers to share experiences;
- an “ask-the-expert” facility with online access to patient safety experts from different countries;
- a bank of virtual patient safety cases with emphasis on a ethical hazards, disclosure and apology;
- an approach to patient safety that includes cultural awareness and respects competences;
- an assessment bank of patient safety items for sharing—for example, the Hong Kong International Consortium for Sharing Student Assessment Banks is a group of international medical schools that maintains a formative and summative bank of assessment items across all aspects of medical courses.

Content experts in patient safety and educational developers are in limited supply and often work in isolation. This impedes the sharing of information, innovation and development and often results in unnecessary duplication of resources and learning activities. A transnational approach to patient safety education will ensure that there is true international capacity-building in patient safety education and training. It is one way that developed nations can assist developing nations by sharing their substantial curriculum development resources.
References


