



**World Health  
Organization**

**Patient Safety**

A World Alliance for Safer Health Care

## Patient Safety Workshop

### Learning From Error



PATIENT SAFETY WORKSHOP

# LEARNING FROM ERROR



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"I am continually moved by the accounts of medical error that affect the lives of real people."



## Foreword

**After an error that has harmed a patient has occurred, we often ask the question: how did this happen?**

It can be very tempting to apportion blame to just one issue or person. But this is too simple. It presupposes that it is possible or right to implicate a single contributing factor. Since the World Health Organization launched WHO Patient Safety in 2004, our experience has been that this is rarely the case.

There is an urgent need to strengthen the defences in the health-care system as a whole. As much as possible, we need to do this without blaming individual health-care workers. That is not to say that individuals should never be held accountable for their actions. However, relying on the blame approach alone is likely to drive problems underground and impede an honest and effective strategy to improve patient safety.

First, we need to understand the extent of the problems that face health-care workers and patients. Medical error rates have been quoted to be in the region of 5-15% per hospital admission in the developed world. Information about the overall state of patient safety in transitional and developing countries is less well known, due to data shortage.

Second, we need reporting systems that are easily accessible to all health-care workers and which facilitate learning. We have learnt that it is possible to get health-care workers to report

incidents, but converting the data collected into real systems change is challenging.

Third, we need to have an accurate way of classifying medical errors so that we can share knowledge internationally and make sense of information from different reporting systems.

Fourth, we need strategies to reduce harm to patients. This means dedicated research to identify the best mechanisms, effective dissemination of new ideas and enthusiastic adoption of them.

Making health care safer has to focus on the patient. I am continually moved by the accounts of medical error that affect people's lives. The consequences are far-reaching: they can destroy lives, affect human relationships and threaten trust in the health-care system. Patients are too often the victims of unsafe care and their points of view need to be heard within health care.

Ensuring safer care is an enormous challenge. By running this workshop, you are helping the international health-care community make another step towards this ambitious but essential goal.

**Sir Liam Donaldson**  
Chair, WHO Patient Safety

## GUIDANCE FOR COURSE ORGANISERS

### **Purpose of the workshop**

This workshop explores how multiple weaknesses present within the hospital system can lead to error. It aims to provide all health-care workers and managers with an insight into the underlying causes of such events. Although the workshop materials revolve around an error involving the inappropriate administration of vincristine, the underlying principles of why an error occurs are universal and the learning objectives can be applied in any error-related situation.

### **Vincristine: what went wrong?**

Vincristine, a widely used chemotherapeutic agent, should only be administered intravenously and never by any other route. Many patients receiving intravenous vincristine also receive other medication via a spinal route as part of their treatment protocol. This has led to errors where vincristine has accidentally been administered via a spinal route, which leads to death in almost every case. Over the last 35 years, this error has been reported approximately 55 times in a variety of international settings. However, errors related to the accidental administration of vincristine via a spinal route continue to occur.





### **Learning objectives**

By the end of this workshop, participants should:

1. Understand why errors occur
2. Begin to understand what actions can be taken to improve patient safety
3. Be able to describe why there should be greater emphasis on patient safety in hospitals
4. Identify local policies and procedures to improve the safety of care to patients

### **Who should be invited to participate in this workshop?**

A multidisciplinary approach is recommended, but this may be adapted as required. This patient safety workshop is designed to be suitable for health-care workers (e.g. nurses, doctors, midwives, pharmacists), health-care workers in training (e.g. nursing students, medical students, residents), health-care managers or administrators, patient safety officers, and any other groups involved in delivering health care.

### **Who should facilitate the workshop?**

This booklet should enable any health-care worker to facilitate a workshop. You may find it helpful to consult a health-care worker familiar with error prevention and root cause analysis techniques. However, this is not essential.

### **How should the workshop be organised?**

The two sessions of the workshop can be delivered on separate days, or together with a short break in between. A schedule is suggested but can be adapted to fit the time available.

### **Session One: root cause analysis**

After watching the drama on the DVD, a trainer should briefly review the concept of learning from error using techniques such as root cause analysis and then divide the workshop into small groups. Blank fishbone templates (Copy Sheet One) are provided and can be photocopied and distributed to the groups to help guide analysis of the patient safety incident seen on the DVD. Each group should then present their findings to the workshop. Trainers are provided with a fishbone analysis diagram with a few suggestions under each heading to prompt discussion, if needed.

### **Session Two: five factors in system errors**

The second part of the DVD analyses the drama in the light of five factors that can reduce error in health care. After watching this, a facilitator can distribute photocopies of questions to consider (Copy Sheet Two) and divide the workshop into small groups. The questions to consider are designed to provide a structure for participants to discuss their own experience of delivering health care, and to identify factors in their own organization which could potentially be changed to reduce the risk of error. It may be easier for each group to consider one area of analysis than for each group to attempt to consider all areas. Groups can then feed back, in the plenary session, to the workshop as a whole, to stimulate wider discussion.

### **Evaluation**

At the end of the workshop, there should be a debriefing session to identify key learning points and to discuss how participants will apply these to their work to improve patient safety. Finally, participants should also complete an evaluation of the workshop (Copy Sheet Three). WHO Patient Safety will be pleased to receive these, to improve future workshops and to share key learning points relating to patient safety.



## Suggested Schedule

Time	Running time	Content	Workshop tools	
			for the Participant	for the Trainer
		Advance preparation		<ul style="list-style-type: none"> <li>• Workshop booklet: Learning from error</li> </ul>
<b>SESSION ONE</b>				
0:10	0:10	<b>Introduction.</b> Facilitator outlines workshop aims and schedule. Each participant gives their name, role, and learning expectations.		<ul style="list-style-type: none"> <li>• Guidance for course organisers</li> </ul>
0:20	0:30	<b>DVD: Learning from error.</b> All watch 20 minute DVD drama depicting vincristine error.		<ul style="list-style-type: none"> <li>• DVD: "Learning from Error" (Part I)</li> </ul>
0:10	0:40	<b>Theory: root cause analysis.</b> Facilitator reviews concepts of root cause analysis and answers questions.		<ul style="list-style-type: none"> <li>• Root cause analysis</li> </ul>
0:20	1:00	<b>Small groups: fishbone technique</b> Facilitator describes fishbone technique. Groups apply technique to DVD drama.	<ul style="list-style-type: none"> <li>• Fishbone template: Copy Sheet One</li> </ul>	<ul style="list-style-type: none"> <li>• Fishbone analysis: discussion prompt</li> </ul>
0:10	1:10	<b>Plenary feedback.</b> Each group gives feedback on their main conclusions. Plenary discussion.		
0:10	1:20	<b>BREAK 10 mins (optional)</b>		
<b>SESSION TWO</b>				
0:20	1:40	<b>DVD: Analyzing error.</b> All watch DVD analysis of error according to five key factors.		<ul style="list-style-type: none"> <li>• DVD: "Learning from Error" (Part II)</li> </ul>
0:20	2:00	<b>Small groups: Five factors in system errors.</b> Discuss the experience of participants in their organizations, using the questions as prompts.	<ul style="list-style-type: none"> <li>• Questions to consider: Copy Sheet Two</li> </ul>	<ul style="list-style-type: none"> <li>• Questions to consider</li> </ul>
0:15	2:15	<b>Plenary feedback.</b> Each group gives feedback on their main conclusions, plenary discussion and brainstorming session on how errors can be prevented in their own organization.		
0:15	2:30	<b>Wrap-up and evaluation.</b> Roundtable where each participant says what they learned and what they will change in their practice. Complete evaluation forms.	<ul style="list-style-type: none"> <li>• Evaluation form: Copy Sheet Three</li> </ul>	



## Factors Contributing to Error

Identifying common factors which contribute to error is critical to the development of viable solutions aimed at making health care safer. This should take account of fundamental flaws and design faults in the system as well as unusual and one-off events. Unfortunately, organizational responses to address these contributing factors have been slow to occur in health care.

In this training package, we have focused on five ways in which errors can be reduced. These are:

- standard operating procedures and guidelines;
- ensuring valid and up-to-date training;
- effective communication;
- medication safety; and
- patient engagement.

Understanding and classifying contributing factors can be a complex task. Making sense of the wide variety of inputs that lead to the final error needs to be made accessible, not just to experts but to all health-care workers. Our experience indicates that the most successful organizations in high-risk industries are focused on error and the possibility of future error. They accept that errors can and will occur, so have internal systems that are ready to deal with errors, know when to request outside assistance, promote a culture that does not accept error and also realise that the first impression in any error is often misleading.

### References

1. Reason J. Beyond the organisational accident: the need for "error wisdom" on the frontline. *Qual Saf Health Care* 2004; 13(Suppl II): ii28-33.
2. Reason J. Human error: models and management. *BMJ* 2000; 320: 768-770.

## Standard Operating Procedures and Guidelines

### Introduction

A standard operating procedure (SOP) is a protocol which details how a certain procedure should be carried out every time it is performed. SOPs are a daily feature of many high-risk industries. Often, there has been resistance to the adoption of SOPs and their uptake in medicine has been disappointingly slow. Barriers to SOP use include the fear that clinical autonomy will be reduced, lack of familiarity with guidelines, not believing that they will actually help, and lack of motivation to change practice. Yet, SOPs provide a real opportunity to make care significantly safer.

Professor Archie Cochrane (Cochrane Collaboration) battled for most of his life to ensure effective health care was free at the point of access and that evidence-based medicine was the normative practice of every health-care worker. An extension of his groundbreaking work is to standardise best practice. This relies on evidence-based treatments and procedures being consistently performed by every health-care worker.

### Clinical decision-making

A common criticism of SOPs has been that they reduce clinical decision-making. SOPs are not designed to turn health care into a production line. Instead, SOPs provide a stable basis, particularly suited to high-risk areas and practices, on which clinical excellence can flourish.

In 2007, a study in New Zealand demonstrated the importance of SOPs. It observed the responses of 20 anaesthetists in a simulated operation and tested their response to the oxygen supply being cut off for 15 minutes. All anaesthetists maintained ventilation throughout the lack of oxygen supply period and turned on the back-up cylinder, but 70% had not realised this was empty preoperatively. Interestingly, none of them tested the composition of the gas when normal oxygen supply returned, a simple test that would be included in every SOP related to handling this type of incident.



“ SOPs provide a stable basis, particularly suited to high-risk areas and practices, on which clinical excellence can flourish. ”



In a similar study during eight simulated paediatric arrests, the number and type of drug errors was recorded. Results showed the potential for serious error: in 17% of cases, the exact dose was not specified; in 59% the route of administration was not specified; in 16% of syringes, there was a deviation of at least 20% from the expected dose.

These situations illustrate the importance of SOPs. They indicate that if adhered to on every occasion, they have the potential to reduce serious harm. Some are simple to implement, like the correct procedure for ensuring the accurate dose of a drug in a syringe, others require more training, like the complex and detailed procedures for advanced life support.

#### Improving learning

Within the aviation industry, airline pilots almost unanimously agree that SOPs make flying safer. It has been demonstrated that not following SOPs is strongly linked to error.

Understanding SOPs can help health-care workers learn across different institutions and even national boundaries. A lumbar puncture kit varies across the world. However, the safest position for the patient and the sites for needle insertion do not vary. A checklist of events helps health-care workers memorise and safely perform clinical duties in addition to providing a framework of safe practice upon which to build further skills. SOPs can also be developed locally to produce best practices appropriate to the resources available.

#### Conclusion

Harm caused by committing the wrong action or omitting to perform the necessary action can be reduced by the presence of SOPs. SOPs give patients the opportunity to identify with their care pathways and to play a part in areas such as medication safety. SOPs aid learning and contribute to the daily functioning of a high quality health-care system. Good leadership and the development of systems to support SOPs are needed to aid their implementation.

#### Selected references

1. Gray JAM. How to get better value health care. Oxford Press, Oxford, 2007. ISBN 978-1-904202-01-1.
2. Hopper J. Left, Right, Left... 'Forward March' towards standard operating procedures? *Knee* 2003; 10(4): 309-10.
3. Kozer E, Seto W, Verjee Z, Parshuram C, Khatatk S, Koren G, Jarvis DA. Prospective observational study on the incidence of medication errors during simulated resuscitation in a paediatric emergency department. *BMJ* 2004; 329: 1321.
4. Rozich JD, Howard RJ, Justeson JM, Macken PD, Lindsay ME, Resar RK. Standardization as a mechanism to improve safety in health care. *Jt Comm J Qual Saf.* 2004; 30(1): 5-14.
5. Donaldson L. On the state of Public Health: Annual report of the Chief Medical Officer 2005. Department of Health, London, 2006.
6. Weller J, Merry A, Warman G, Robinson B. Anaesthetists' management of oxygen pipeline failure: room for improvement. *Anaesthesia* 2007; 62(2): 122-126
7. Cabana MD, Rand CS, Powe NR, Wu AW, Wilson MH, Abboud PA, Rubin HR. Why don't physicians follow clinical practice guidelines? A framework for improvement. *JAMA* 1999; 282(15): 1458-1465.

## Ensuring Valid and Up-to-Date Training

### Introduction

Patient safety as a topic is largely absent from health-care education, demonstrating the low priority given to safe patient care. Safe care for patients can only be optimised if health-care workers receive the right training and are helped to keep up-to-date with knowledge.

This situation represents a deeper system failure which has two main components. Firstly, a failure to address patient safety education in training, and secondly a failure to ensure the competence of health-care workers through regular and up-to-date training and assessment.

### Patient safety education

Within other high-risk industries, rigorous safety procedures and hundreds of hours of training are put in place to prevent harm to human life. In aviation, safety procedures are ingrained and assessed during flight training and throughout a pilot's working life, through regular assessment and appraisal. The same is not true of health care. The development and implementation of patient safety as a core curricular topic, would contribute to providing a framework for safe practice during a clinician's professional life\*.

### Human factors

The field of human factors concerns the interaction between humans and the system in which they work. Training in non-technical skills has been shown to be vital to reduce errors in other industries. However, although human factors training exists within medicine, it is often not seen as a core part of daily work. Topics such as task management, multidisciplinary team working, risk perception and prediction, decision making and recognition of personal and technological limitations all contribute to a deeper understanding of error and have been shown to prevent error. Nevertheless, these concepts are still not taught with the same rigour as more traditional educational topics.

### Simulation

Simulation has been shown to be useful at both the undergraduate and postgraduate levels. Students often find it difficult to acquire the range of experience they need. Simulation of procedures, ranging from venepuncture to laparoscopic cholecystectomy, offers the opportunity for turning standard operating procedures into habits and allows practice of manual skills without the risk of causing harm to a real patient.

Simulation has also been successfully used in the training of teams and in the familiarisation of daily routines. For many years, the Advanced Life Support courses have assessed trainees in simulated scenarios, where practical skills, teamwork and leadership are required to ensure safe and high-quality outcomes.

### Ensuring competence

Medical education has traditionally taken the form of an apprenticeship. Students are often encouraged to learn based on the principle of *see one, do one, teach one*. This is rarely an appropriate method of ensuring safe health care. It also reinforces a culture in which training is not prioritized.

Poorly trained health-care workers can be a major contributing factor leading to adverse events. Staff may not be well placed to judge their own level of competence; they may also be overconfident as a consequence of their own limited experience.

National bodies and individual institutions need to ensure they have the systems in place for validating health-care workers' skills. Many countries are reasonably successful at ensuring a certain standard as part of undergraduate training. However, all too often, the last assessment of a health-care worker's skills and competencies takes place upon graduation from their university or college.

Education deserves a higher profile within health-care provision. Investing in protected teaching time, which is not disturbed by



normal duties, is one way of emphasising the importance of training. Assessments are not just about ensuring a certain and sustainable level of skill, knowledge or competence, they are also a reflection of a wider culture of safe and effective practice.

### Conclusion

Education and validation of competency are critical components in the quest to improve patient safety. At the very least, all health-care workers must be competent to deliver *safe* care, and their organization must have mechanisms to check this. Education needs to be broadened to include explicit patient safety topics, such as human factors, and methods, such as simulation, designed to create a generation of health-care workers who deliver consistently safe care.

### Selected References

1. Wakefield A, Attree M, Braidman I, Carlisle C, Johnson M, Cooke H. Patient safety: do nursing and medical curricula address this theme? *Nurse Educ Today* 2005; 25(4): 333-340.
2. Glavin RJ, Maran NJ. Integrating human factors into the medical curriculum. *Med Educ*. 2003; 37 (Suppl. 1): 59-64.
3. Moorthy K, Munz Y, Adams S, Pandey V, Darzi A. A human factors analysis of technical and team skills among surgical trainees during procedural simulations in a simulated operating theatre. *Ann Surg*. 2005; 242(5): 640-1.
4. Paparella SF, Mariani BA, Layton K, Carpenter AM. Patient safety simulation: learning about safety never seemed more fun. *J Nurses Staff Dev*. 2004; 20(6): 247-252.
5. Moorthy K, Vincent C, Darzi A. Simulation based training. *BMJ* 2005; 330: 493-494.
6. Donaldson L. Good doctors, safer patients: Proposals to strengthen the system to assure and improve the performance of doctors and to protect the safety of patients. Department of Health, London, 2006.
7. Walton MM, Elliott SL. Improving safety and quality: how can education help? *Med J Aust*. 2006; 184(10): S60-S64.
8. Perry SJ. An overlooked alliance: using human factors engineering to reduce patient harm. *Jt Comm J Qual Saf*. 2004; 30(8): 455-9.
9. Reason J. Understanding adverse events: human factors. *Qual Health Care* 1995; 4(2): 80-9.
10. Patey R, Flin R, Cuthbertson BH, MacDonald L, Mearns K, Cleland J, Williams D. Patient safety: helping medical students understand error in healthcare. *Qual Saf Health Care* 2007; 16(4): 256-9.

\*WHO Patient Safety Curriculum Guide for Medical Schools is available online:

[www.who.int/patientsafety](http://www.who.int/patientsafety)

# Communication

## Introduction

Effective communication is key to patient safety. A review of root cause analyses suggests that in over 60% of errors, poor communication was an important causal factor. Effective communication is also crucial to managing an incident once it has occurred.

Communication in the health-care setting may be divided into two types: those between one health-care worker and another, and those between the patient (and/or family member) and a health-care worker. Each has different elements that can contribute to medical errors.

## Communication between patients and health-care workers

The patient/health-care worker interaction is complex. Part of the complexity is due to changing expectations. Fifty years ago, patients were accustomed to a health-care worker being dogmatic and paternalistic. Today, patients usually look to their health-care worker to help them navigate through a complicated system and they expect communication to be based on shared decision-making. However, neither model is correct all the time. The type of communication model that is needed depends very much on the specific situation.

During an interaction between a patient and a health-care worker, various forms of communication may be used. The least studied area is non-verbal communication. The clues that patients pick up from their health-care worker's body language have been shown to be crucial in the way the patients interpret the information they are given.

Verbal communication studies have shown differences between how health-care workers think they are communicating and how patients perceive the transfer of information. One of the most important factors that contributes to communication is the ability of patients and health-care workers to

communicate in the same language. Studies have shown that providing interpreters is not only better for patients but also cost-effective. What is not clear is how best to provide such interpretation. All are agreed that professional interpreters are the most accurate. However, they are not always available and are costly. Patients prefer family members as a second best, whereas health-care workers seem to prefer using telephone interpreting.

Even when both speak the same language, research has highlighted further verbal communication issues, which arise in part from lack of training on the part of health-care workers. The language that health-care workers think is clear may still appear as confusing medical jargon to a patient. Health-care workers also tend to control the flow of communication with patients. For example, they too often ask closed questions (where the expected response is 'yes' or 'no'), which put up barriers to the patient communicating freely. Another difficult area is how to communicate risk without frightening patients. Teaching can improve health-care worker communication, but access to this is often limited.

A common method that may be used to communicate between patients and health-care workers is written information. This too has pitfalls. Many patients find understanding written health-related information difficult. Studies show that the ability to understand this sort of material – also known as Functional Health Literacy (FHL) – is not correlated to other forms of literacy. Furthermore, the average FHL appears to be much lower than the FHL required to read the material generally produced. In addition, novel techniques like patient support material on the internet require literacy skills to navigate the sites, that not everyone possesses. Institutions are succeeding in overcoming these barriers, but it requires new methods, like the use of DVDs or pictograms.



### Communication between health-care workers

Research has identified that communication among health-care workers plays a significant role in the development of errors: incomplete handovers, illegible handwriting and unclear instructions are a few examples. Health care is also very hierarchical and junior staff rarely feel confident to speak out about concerns they may have. Many of these problems are not unique to health care, and we can learn from external examples.

Crew Resource Management is a technique borrowed from the aviation industry and designed specifically to try to break down hierarchy. Through team-building exercises, professionals are empowered to speak out. This is crucial in identifying errors before they occur. This technique has been used in anaesthesia, emergency medicine and obstetrics. Others have tried to reengineer the team structure. At Harvard University, they have redesigned the ward round. By actively including pharmacists on the round, they have dramatically reduced medication-related errors.

### Communication and the management of incidents

When an incident occurs, communication is fundamental to managing the adverse event. Apologising and explaining to the patient and their family is morally necessary, albeit difficult. Receiving an apology is one of the main objectives of patients when campaigning for increased error disclosure. Lack of information and apology are key reasons for patients taking legal action. Apologising has even been shown to be cost-effective. Patients and their families want to know that the lessons learned in one place will be communicated more widely. The role of communicating with patients after an error is explored further in the chapter on 'Patient Engagement'.

Communicating with the health-care team after an error has occurred is also vitally important. Health-care workers may be personally affected after involvement in care which has resulted in error. Understanding this and providing support to health-care workers is challenging, and necessary.

### Conclusion

Communication plays a significant role in all aspects of error. Firstly, improving the quality of communication among health-care workers and between patients and health-care workers can help prevent errors. Secondly, good communication is imperative when dealing with errors once they have occurred.

### Selected References

1. Bourhis RY, Roth S, MacQueen G. Communication in the hospital setting: a survey of medical and everyday language use amongst patients, nurses and doctors. *Soc Sci Med*. 1989; 28(4): 339-346.
2. Davis TC, Mayeaux EJ, Fredrickson D, Bocchini JA Jr, Jackson RH, Murphy PW. Reading ability of parents compared with reading level of pediatric patient education materials. *Pediatrics* 1994; 93(3): 460-468.
3. Hampers LC, Cha S, Gutglass DJ, Binns HJ, Krug SE. Language barriers and resource utilization in a pediatric emergency department. *Pediatrics* 1999; 103(6 Pt 1): 1253-1256.
4. Kraman SS, Hamm G. Risk management: extreme honesty may be the best policy. *Ann Intern Med* 1999; 131(12): 963-967.
5. Leape LL. Reporting of adverse events. *N Engl J Med* 2002; 347(20): 1633-1638.
6. Murphy PW, Chesson AL, Walker L, Arnold CL, Chesson LM. Comparing the effectiveness of video and written material for improving knowledge among sleep disorders clinic patients with limited literacy skills. *South Med J*. 2000; 93(3): 297-304.
7. Ong LM, de Haes JC, Hoos AM, Lammes FB. Doctor-patient communication: a review of the literature. *Soc Sci Med*. 1995; 40(7): 903-918.
8. Kaplan SH, Greenfield S, Gandek B, Rogers WH, Ware JE Jr. Characteristics of physicians with participatory decision-making styles. *Ann Intern Med*. 1996; 124(5): 497-504.
9. Maguire P, Fairbairn S, Fletcher C. Consultation skills of young doctors: I--Benefits of feedback training in interviewing as students persist. *Br Med J (Clin Res Ed)* 1986; 292(6535): 1573-6.



# Medication Safety

## Introduction

In the past, safety issues surrounding medication have centred on *adverse drug reactions* due to the side-effects of correct medication. *Medication safety* is a broader term that encompasses errors which are not side-effects of the intended drug, but, for example, the result of the wrong drug being administered in error or the right drug being given in the wrong dose or via the wrong route. These are termed *adverse drug events*.

## Prevalence

Harm from adverse drug events occurs across the world. Some studies suggest that they account for a quarter of all medical errors. In the United States, Australia and France, adverse drug events occur in approximately 4% of hospital admissions and death results from these errors 5-10% of the time. In the United Kingdom, over 1000 people died from adverse drug events in 2001 alone. It has been suggested that 75% of these errors are preventable.

## Causation of errors

Sometimes written medical notes are the only means health-care workers have of communicating with each other. Medical records need to be clear and unambiguous. They need to provide an accurate way of conveying important information. This is especially important when the written information concerns drug dosages, delivery timings and changes to the current regime. Sometimes, medical notes are not kept up-to-date, and in addition transcription is problematic. These contributing factors have been shown to be the root cause of many adverse drug events.

In much of the world, drug labelling is still carried out by hand. Often, despite rigorous double-checking procedures being in place, errors still occur. Standard operating procedures should dictate exactly how drugs,

in particular high-risk drugs, should be checked, prescribed, dispensed and delivered. Technology should be used wherever possible. It is critical that all hospitals, clinics and treatment centres have established policies to ensure medication safety.

There are certain principles that underpin safe operating in this area. For example, all drugs need to be clearly labeled with unique identifiers, labels need to be easily visible and storage precautions on the ward need to be considered. Drugs need to be properly checked by the designated person against the patient's medical records and drug chart. For high-risk treatments like chemotherapy, drugs should only be given by nurses and doctors with specialized registered training. Health-care workers are often unaware of the level of competence of their contemporaries and the prevailing culture frequently makes this awkward to challenge.

At an organizational level there are also barriers that can be put in place to prevent adverse drug events. For example, *look-alike sound-alike medicines* that have similar names, such as lasix (furosemide) and losec (omeprazole), can cause confusion unless safeguards are in place to prevent this.

## Medication reconciliation

Medication reconciliation seeks to establish what medications a patient should be receiving in a formal record to prevent communication breakdowns. At the local level, WHO recommends that a complete list of medications is kept for each patient, which:

- is provided at every care transfer;
- includes hospital and *over the counter* medications;
- specifies the timing, dose and route; and
- matches the patient's actual habits.

It is likely that involvement of the patient in the medication reconciliation process would help reduce adverse drug events still further.



On the ward, the medication chart needs to be highly visible and checked and updated regularly at specified times. The list should be updated and clearly communicated at all transitions between care providers, such as shift handovers and patient discharge. Standardized forms should be used wherever possible.

In the longer term, an international standardized card that a patient could carry might help eliminate errors in the transfer of information. In addition, electronic versions of the above systems, although not yet available globally, have been shown to significantly reduce adverse drug events. One hospital which has dedicated itself to a medication reconciliation programme, based on many of the standards above, reduced adverse drug events by 85% over a 10-month period.

### Learning

Reporting and learning systems that are non-punitive and include adverse drug events are potentially of high value to health care. These types of errors frequently reveal deficits in underlying systems rather than individual failures. Reporting systems need to be strengthened so that this type of information can be elicited from them.

### Conclusion

The high prevalence of adverse drug events, the extent of harm and the existence of viable solutions make the reduction of injury in this area a very important and urgent goal. Strategies of medication reconciliation at the local level and organizational policy implementation, regarding procurement and other drug-related issues, should remain high on the agenda. Medication safety continues to be one of the most pressing issues of the patient safety agenda.

### Selected References

1. The Importance of Pharmacovigilance (Safety monitoring of medicinal products). World Health Organization, Geneva, Switzerland, 2002.
2. Bates DW, Cullen DJ, Laird N, Petersen LA, Small SD, Servi D, Laffel G, Sweitzer BJ, Shea BF, Hallisey R, et al. Incidence of adverse drug events and potential adverse drug events. Implications for prevention. ADE Prevention Study Group. *JAMA* 1995; 274(1): 29-34.
3. Bates DW, Boyle DL, Vander Vliet MB, Schneider J, Leape L. Relationship between medication errors and adverse drug events. *J Gen Intern Med*. 1995; 10(4): 199-205.
4. Brennan TA, Leape LL, Laird NM, Hebert L, Localio AR, Lawthers AG, Newhouse JP, Weiler PC, Hiatt HH. Incidence of adverse events and negligence in hospitalized patients. Results of the Harvard Medical Practice Study I. *N Engl J Med*. 1991;324(6):370-6.
5. Thomas EJ, Studdert DM, Burstin HR, Orav EJ, Zeena T, Williams EJ, Howard KM, Weiler PC, Brennan TA. Incidence and types of adverse events and negligent care in Utah and Colorado. *Med Care*. 2000; 38(3): 261-71.
6. Baune B, Kessler V, Patris S, Descamps V, Casalino E, Quenon JL, Farinotti R. Iatrogénie médicamenteuse à l'hôpital: enquête un jour donné. *Presse Med*. 2003; 32(15): 683-8.
7. Lazarou J, Pomeranz BH, Corey PN. Incidence of adverse drug reactions in hospitalized patients: a meta-analysis of prospective studies. *JAMA*. 1998; 279(15): 1200-5.
8. Audit Commission. A Spoonful of Sugar – Medicines Management in NHS Hospitals. Audit Commission Publications, Wetherby, UK, 2001. <http://www.audit-commission.gov.uk>
9. The Quality in Australian Health Care Study. Wilson RM, Runciman WB, Gibberd RW, Harrison BT, Newby L, Hamilton JD. *Med J Aust*. 1995; 163(9): 458-71.
10. World Health Organization Collaborating Centre for Patient Safety Solutions. Assuring Medication Accuracy at Transitions in Care. World Health Organization, Geneva, Switzerland, 2007. <http://www.jcipatientsafety.org/24725>
11. Institute of Medicine. Preventing Medication Errors. The National Academies Press, Washington, USA, 2006.

# Patient Engagement

## Introduction

To many patients, the risk of unsafe health care is far from their thoughts when they consult a doctor. Patients hope and expect that health-care workers will provide them with safe and appropriate care. Providing and receiving health care is an act of partnership and trust between patients and health-care workers. Involving patients more in the process of their care is one of the routes to providing safer care.

## Involving individual patients to prevent errors

Many health-care organizations actively encourage patient engagement to reduce errors and help understand the causes of harm. Patients have a unique perspective; they are often the only ones to see the whole pathway of care and have a valuable insight into the way care is communicated and delivered.

There are many ways in which patients can become involved in making health care safer. First are patients who are better informed about their condition and treatment, through the provision of information on their diagnosis and the treatment options available. Patients and their families need to be encouraged to report safety concerns whenever they occur, either through formal reporting systems or by speaking to dedicated and trained staff. Having a relative or friend present can support patients in understanding the decisions being made and who can be an advocate for safety on their behalf if they are anxious, unwell or confused.

Patient advocacy and patients' rights organizations are increasingly being set up to work with health-care organizations. They can play important roles, for example in campaigns to support and encourage patients to ask questions and to check that their treatment is correct. This has been extended to campaigns to remind staff about hand hygiene. Many of these organizations are run by patients and families who have experienced unsafe care and are passionately

committed to patient safety and the prevention of future harm.

Sharing patients' experiences with health-care workers in training encourages a culture where patients are valued and their active participation in the decisions about their treatment is the normal practice. Patients' own stories of unsafe care are an important source of information and insight and can be used effectively to better understand the causes of error and the devastation that can follow.

## Barriers to patient participation

Patients are often reluctant to participate because they feel unauthorised to do so. Patients are often unaware of the risks of health care, and greater awareness of patient safety is needed at international, national and institutional levels. Errors can and do happen in the health-care setting, and patients need to be informed of this and that their participation can help reduce risks. However, the most effective way to educate patients remains to be determined.

Effectiveness of patient involvement programmes requires further research. Even though many have suggested patients can play a role in preventing medical errors, evidence in the medical literature concerning its effectiveness is limited.

Health-care workers need to change their habits to encourage patient involvement. Health-care workers often refuse to hand over power to patients. This refusal is multifactorial: during their training they were not taught to involve patients, and they are reluctant to abandon the paternalistic model of health care. Health-care workers also often perceive that involving patients would be time consuming, even though this has not been proven in clinical studies.

Patients and families report that when things go wrong, they are often met with a wall of silence, denial and even hostility. In these circumstances, patients can quickly lose confidence and trust in their carers. In addition to any physical effects, patients may also suffer emotionally from knowing



that they have been harmed. Patients should be provided with information, support and advice after an error has occurred.

In many countries, patients may be grateful just to be able to access health facilities and may therefore be unwilling to seek out the reasons for errors in their care or the causes of any harm. Patients may feel a sense of disloyalty to professional staff or may fear the real or perceived consequences of raising questions about how the care is provided. Patients also report that the opportunity to learn is often frustrated by efforts to conceal error. Such conduct encourages confrontation, potentially damaging the relationship of trust between health-care workers and patients. This often leads to litigation, rather than offering healing to all parties.

### Conclusion

Patients are becoming more engaged with local health-care organizations, nationally and globally. Promoting open and honest relationships between health-care workers and patients will create forums for dialogue and effective mechanisms to build safer health-care systems. Health-care workers must embrace the concept of patient engagement. Each individual caregiver, and the whole health-care system, must openly support and encourage their participation.

### Selected References:

1. Hibbard JH, Peters E, Slovic P, Tusler M. Can patients be part of the solution? Views on their role in preventing medical errors. *Med Care Res Rev.* 2005; 62(5): 601-16.
2. Mansell D, Poses RM, Kazis L, Duefield CA. Clinical factors that influence patients' desire for participation in decisions about illness. *Arch Intern Med.* 2000; 160(19): 2991-6.
3. Henderson S. Power imbalance between nurses and patients: a potential inhibitor of partnership in care. *J Clin Nurs.* 2003; 12(4): 501-8.
4. Cahill J. Patient participation-a review of the literature. *J Clin Nurs.* 1998; 7(2): 119-28.
5. Willems S, De Maesschalk S, Deveugele M, Derese A, De Maeseneer J. Socio-economic status of the patient and doctor-patient communication: does it make a difference? *Patient Educ Couns.* 2005; 56(2): 139-46.
6. Brennan PE, and Safran C. Patient Safety: Remember who it's really for. *Int J Med Inform* 2004; 73: 547-550.
7. International Alliance of Patients' Organizations [www.patientsorganizations.org](http://www.patientsorganizations.org)
8. World Health Organization. World Alliance for Patient Safety: Patients for Patient Safety. [www.who.int/patientsafety/patients\\_for\\_patient/en](http://www.who.int/patientsafety/patients_for_patient/en)

## Learning from Error

### Session One: Root Cause Analysis

In a safe clinical environment, systems are in place to prevent errors and to try to ensure that patients are not harmed when errors inevitably occur.

When error occurs, the customary focus on blaming the individual care-giver overlooks the conditions in which the error occurred. This misses the opportunity for the organization to learn how to make its environment safer. Human error cannot be eliminated from the clinical setting. Systems can be designed to help individuals avoid error and minimise the harmful effect of errors.

Root cause analysis is the systematic analysis of all the factors which are predisposed to, or had the potential to prevent, an error. It can be applied to incidents in which there was avoidable patient harm, or in 'near misses' in which a situation or event put patients at risk of harm. Organizations can use root cause analysis both to explain how the incident occurred and to design mechanisms to prevent it from happening again.

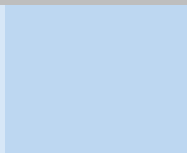
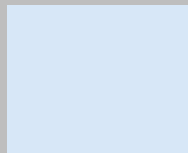
There are many tools available for use in root cause analysis. One tool is the 'fishbone technique'. Nine groups of contributory factors are identified in this example. These may be broken down into subgroups. For example, patient factors may be subdivided into clinical condition, social factors, physical factors, mental and psychological factors and interpersonal relationships. Each group of factors can then be considered individually, to assess its relevance to the specific incident being studied. This method provides a prompt for considering each of a wide range of factors. It also allows contributing factors that are identified to be displayed in a simple schematic diagram.

To conduct root cause analysis certain steps need to be taken:

1. Define which events require investigation; for example those which were, or could have been, fatal and might be repeated, but which are felt to be preventable.
2. Select a multidisciplinary team, including an expert in the specialty and a person experienced in incident investigation.
3. Gather information by interviewing all of the people involved (using free recall and semi-structured interviews), reading all available documentation, examining equipment and inspecting the site at which the event occurred. This may include reconstruction of the event.
4. Collate information from all sources into one user-friendly form, such as a timeline.
5. Ask all those who were involved to identify what aspects of service delivery they think contributed to the event, for example by identifying how the event deviated from normal practice.
6. Use an investigation tool such as the fishbone template to identify factors that contributed to, or had the potential to prevent, the event.
7. Develop targeted recommendations that could be implemented to reduce the potential for this event to recur. Recommendations should be simple, specific and measurable; it is easy to say but hard to implement a recommendation that "everyone should try not to do that again".
8. Publish a report to share the lessons that have been learnt within the organization and more widely in health care.

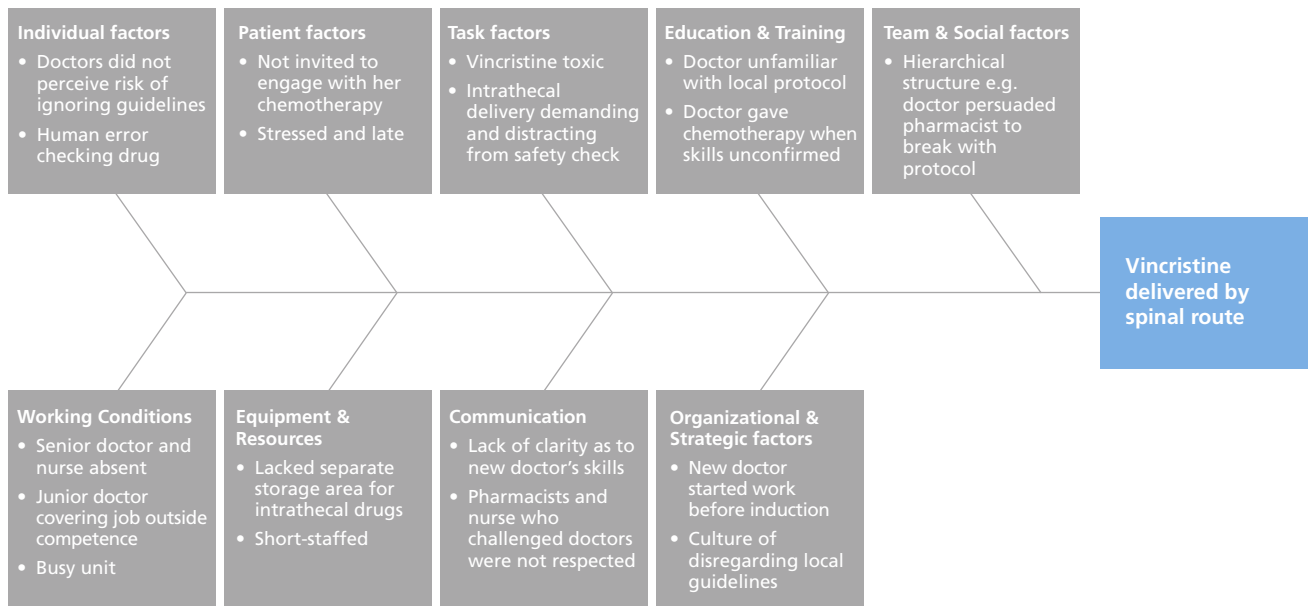


“When error occurs, the customary focus on blaming the individual care-giver overlooks the conditions in which the error occurred.”





## Fishbone Analysis: discussion prompt for course facilitators



Tool developed by the NHS National Patient Safety Agency, UK



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## The Fishbone Template



Tool developed by the NHS National Patient Safety Agency, UK

## Copy Sheet Two: Questions to Consider

Please use these questions to reflect on your experience of providing health care within your own organization.

### 1. Standard operating procedures and guidelines:

1. Could standard operating procedures and guidelines be put in place to make delivery of care safer?
2. Are standard operating procedures and guidelines adhered to, and if not, what pressures prevent their implementation?
3. Is there a culture of contempt for standard operating procedures and guidelines in your organization?

### 2. Ensuring valid and up-to-date training:

1. How do you know that the colleagues you work with have received the training they need to do their job well?
2. Do you have a way of assessing the colleagues you work with to ensure they are competent?
3. Do you have a framework in place to ensure induction with local procedures?
4. Do you know what you should do if you have concerns about the competence of your colleagues and the safety of their practice? Would you be supported if you were to voice your concerns?
5. How would you know if your health-care system allowed an unskilled/untrained health-care worker to practise?

### 3. Communication:

1. To what extent, in your health-care setting, have you addressed the need to have effective multidisciplinary communication?
2. Do staff value, or even know about, each other's roles?
3. Can junior staff approach senior staff and make a legitimate enquiry about the safety of a situation?
4. Do you work well as a team?

### 4. Medication Safety:

1. Are medical notes easily accessible, kept regularly up-to-date and legible?
2. Do your procurement policies ensure consistency of drug purchasing and checking mechanisms to detect potential errors such as look-alike and sound-alike medications?
3. Do you have systems in place to ensure only those properly trained are able to be involved in delivering high-risk drugs?

### 5. Patient engagement:

1. What happens in your organization to ensure that patients are active partners in their own treatment?
2. How could your organization play a more active role in this challenge?
3. Could other means of engaging patients be used, such as posters, leaflets and patient treatment cards?

### Summary:

1. Do you have standard operating procedures and guidelines in your workplace?  
Are they adhered to?  
If not, why not?  
Could you develop some?
2. Do you have a framework in place to ensure that health-care workers are up-to-date with training and safe to practise?
3. Do you communicate effectively with your colleagues as part of a multidisciplinary team?
4. Is information about the safe use of drugs accessible to you?
5. Have you engaged your patients in their care?



## Copy Sheet Three: Evaluation Form

Thank you for taking the time to complete this evaluation form.  
It will help us improve our workshops in future.

I am a (please circle)

Nurse Doctor Pharmacist Manager Other (please state) .....

**How important do you think patient safety is in your clinical practice?**

- Not at all important
- Not very important
- Neutral
- Quite important
- Very important

**Do you believe that other people in your team think that patient safety is important?**

- Definitely no
- Possibly no
- Neutral
- Possibly yes
- Definitely yes

**How confident are you that you could identify factors in your workplace that are likely to play a role in patient safety?**

- Very unconfident
- Quite unconfident
- Neutral
- Quite confident
- Very confident

**How easy would it be for you to suggest changes in your workplace?**

- Very difficult
- Quite difficult
- Neutral
- Quite easy
- Very easy

**How likely is it that you will suggest changes in your workplace in the next three months?**

- Very unlikely
- Quite unlikely
- Neutral
- Quite likely
- Very likely

What changes might you suggest?

.....  
.....

**How likely is it that other factors will make it difficult for you to suggest changes in your workplace?**

- Very unlikely
- Quite unlikely
- Neutral
- Quite likely
- Very likely

What might make it difficult for you?

.....  
.....

**How important do you think each of these factors is in patient safety in your clinical area?**

- Standard operating procedures or guidelines
  - Not at all important
  - Not very important
  - Neutral
  - Quite important
  - Very important

• Communication

- Not at all important
- Not very important
- Neutral
- Quite important
- Very important

• Training

- Not at all important
- Not very important
- Neutral
- Quite important
- Very important

• Medication safety

- Not at all important
- Not very important
- Neutral
- Quite important
- Very important

• Patient engagement

- Not at all important
- Not very important
- Neutral
- Quite important
- Very important

1                      2                      3  
 very poor          poor                      acceptable

4                      5  
 good                      very good

1. How did you rate the workshop overall?

1      2      3      4      5

2. What was the quality of the material provided?

1      2      3      4      5

3. How relevant was the workshop to your clinical work?

1      2      3      4      5

4. What was done well?

.....  
 .....

5. What could be improved?

.....  
 .....

Thank you for attending the Learning from Error Patient Safety Workshop

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