

# **Patient Safety Toolbox: instruments for improving safety in health care organisations**



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## Safety Improvement for Patients in Europe – the SIMPATIE Project

In February 2005, the Directorate General Health and Consumer Protection of the European Commission (SANCO) provided a grant to an international consortium led by the Dutch Institute for Healthcare Improvement – CBO – to implement the SIMPATIE project. This project is part of the cooperation between Member State activities of the DG SANCO, supporting action on ‘improving information and knowledge on public health’, and will run for two years.

The project has been designed to use Europe-wide networks of organisations, experts, professionals and other stakeholders to establish, within two years, a common European set of vocabulary, indicators, and internal and external instruments for improvement of safety in health care. The set will be disseminated to all the parties involved.

Specifically, SIMPATIE aims to:

- 1 Establish systematic knowledge repository on patient safety related to legislation, regulation and actions in EU states
- 2 Translate the Council of Europe recommendation on Prevention of Adverse Events into a practical and usable tool for the work floor
- 3 Formulate a vocabulary (set of definitions) and a set of system and organisation indicators / outcome measures related to patient safety
- 4 Define, with regard to patient safety, recommendations for external evaluation of health services, including selected instruments that can be used for improvement
- 5 Define, with regard to patient safety, recommendations for internal evaluation of health services, including a set of instruments that can be used for improvement
- 6 Develop an expert consensus on recommendations and instruments, described in the above-mentioned objectives (2-5)
- 7 Disseminate results to the wider public and the parties involved.

The project is being carried out by an international consortium that includes CBO Dutch Institute for Healthcare Improvement, Action against Medical Accidents / LMCA (AvMA is a UK patient organisation, LMCA is an umbrella association), Council of Europe (international organisation), European Hospital and Healthcare Federation (HOPE – international NGO), European Society for Quality in Healthcare (ESQH – international NGO), Standing Committee of European Doctors (CPME – international NGO) and High Health Authority (HAS – national agency, France).

This publication has been produced as part of the activities surrounding the development of a set of instruments for safety evaluation and improvement in health care organisations.

More information on the project can be found on its website [www.simpatie.org](http://www.simpatie.org), or through the project secretariat at CBO, [simpatie@cbo.nl](mailto:simpatie@cbo.nl).

# Preamble

The progress in science and technology, combined with advanced specialisation in health care are leading to increasingly complex care situations for increasingly frail patients. We should realise that health care is becoming less safe partly because of this enormous progress in hospital care. Making errors is a normal, but with regard to outcome often undesired deviation in human behaviour. The risk of errors increases in complex situations with hierarchical relationships. To be able to reduce the risk of errors and incidents in hospitals, many different actions could be undertaken. These will be discussed further.

Increasing attention to and action on safety problems is urgently needed. Unfortunately, up to now there is limited scientific evidence on the effectiveness of specific interventions. We are forced to use whatever evidence or experience is available, combined with the analysis and understanding of the problem and the local situation, when selecting actions that should be undertaken in a given organization. The project has developed an overview of these actions / instruments, that is being presented for discussion. However, even as we are discussing them new knowledge is being generated about the ones listed here and new innovative approaches are being initiated.

Therefore the key issue being presented here for discussion is:

What would be the ways and means of further cooperation in Europe in order to increase learning, knowledge and exchange related to different approaches to improve patient safety and facilitate their implementation in health care organizations.

For the purpose of discussion we have classified instruments, evaluated within the scope of the project, in three groups. Some of the instruments include aspects from more than one group.

## **1. Instruments for registration of information (data) relevant for safety**

These include both specific registration of safety incidents as well as possible data sources for safety information derived from other, more general, registration systems. Important feature here is the possibility to develop or define indicators and benchmarks that can be used for comparison on different level (within organization, between organizations on regional, national and European level)

## **2. Tools for analysis of safety incidents and risks**

The group includes two types of instruments:

- for retroactive analysis: Root Cause Analysis (Systematic Incident Reconstruction and Evaluation, Prisma) and Trigger tool status study.
- for proactive analysis: Health Failure Mode Effect Analysis and Bow tie model

### **3. Intervention approaches**

Two levels of intervention can be roughly distinguished here, although experience indicates that best results of these interventions can be achieved when action is taken simultaneously on both levels.

- Interventions directed towards the system, namely organizational leadership, culture, communication, management and relations. This includes attention to safety culture, involvement of patients, a safety management system, crew resource management and multidisciplinary team training.
- Interventions directed to specific processes of professional health care delivery. Many of them are specifically developed to improve communication within one or more care processes and teams, including walk rounds, briefings, time out or SBAR. Others have been designed with a specific group of patients at safety risk in mind, like bundles or rapid response teams. Some combine both aspects and include system components, like a package of interventions developed to decrease hospital mortality (move your dot or campaign approach).

## **Introduction**

### **“Primum non nocere”**

Patient safety: the hidden problem in our health care system. Health care has as its mission to cure and to relieve suffering the best we can according to the “state of the art”-scientific knowledge, realizing that our “object of care” is a fellow human being. All professionals and managers agree to this mission with their whole heart.

But, at the same time we harm patients unintentionally by the way we organize and deliver care: professional by over- and underuse (and sometimes misuse) of effective care, organisational by making healthcare too complicated and fragmented and relational by forgetting that our patient is a human being with insecurities, feelings and specific needs.

The IOM-report “To err is human” (USA, 1999) did highlight this “hidden” problem in a comprehensive, not blaming way with the intention to create a culture of learning and improvement in stead of the usual “naming, blaming and shaming”.

This report has effected a big impact in many countries. The confronting facts about the lack of patient safety in our healthcare system have been confirmed in many countrywide research projects since. What we still consider acceptable in our healthcare system would be totally unacceptable in other industries. That’s one of the reasons we can learn a lot from the approach and results to assure safety in airline industries, oil companies, nuclear power plants, etc.

In many countries numerous initiatives have been taken – both national and within healthcare institutions – to promote patient safety. The results are inspiring to continue on this road.

Patient safety management is a clear distinguishable, but inseparable part of our quality management system, that should be part of our normal management and leadership systems, both professional and managerial.

This book is written for professional and managerial leaders on all levels and for everyone who is really motivated to make healthcare a safe place for patients.

Emphasis is on learning and improvement, seeing the real facts, but at the same time asking the basic questions of “five times why” to discover the root causes of unsafety, that harm patients and to offer solutions that have been proven successful.

It helps professional and managerial leaders to build a strategy for improving safety: a patient safety management system. It offers tools and instruments both to pro-active improve patient safety, and to reactive learn from what has gone (almost) wrong. It also address the way leaders need to take initiative to change the culture of the organisation into a learning, blame free environment: especially by their own personal example in the way they manage.

In this effort professionals, managers, leaders on all levels have to collaborate to get breakthrough results.

The challenge after reading this book is on doing: applying what has proven to be successful.

Our mission is to cure and relieve suffering not to (unintentionally) harm patients:

“Primum non nocere”

# Table of Contents

Safety Improvement for Patients in Europe – the SIMPATIE Project  
Preamble

Introduction

## PART I ASPECTS OF PATIENT SAFETY IN HEALTH CARE

1 What is patient safety?  
S.M. Smorenburg, J. Kievit, J.J.E. van Everdingen, C.Wagner

2 Patient safety from an international perspective  
R. van der Sande, A.J. Mintjes, W.H. van Harten

3 Why are hospitals not as safe as we would like them to be?  
J.J.E. van Everdingen, A.Molendijk, W.H. van Harten

4 The epidemiology of medical errors: do we know what we are measuring?  
R.W.M. Giard

5 The safety management system: approach at the organisation level  
W.H. van Harten, W.M.L.C.M. Schellekens, J. Kievit, S.M. Smorenburg

## PART II EXAMPLES OF PATIENT SAFETY TOOLS

6 Patient involvement  
P. Walsh

7 Patient safety culture: assessment instruments  
S. Kristensen, P. Bartels

8 Move your Dot: example for improving patient safety  
L. Touwen, M.A. Tervoort, H. van Dijk, M. Orsini

9 Trigger tool and study of medical records: instrument for detecting adverse events  
S.M. Smorenburg, C.Wagner

10 Bow-tie model: instrument for risk analysis  
P.C. Wierenga, L. Lie-A-Huen

11 Health Failure Mode Effect Analysis: instrument for proactive risk analysis  
P.M.J. Reijnders-Thijssen

12 Root Cause Analysis: instrument for reactive risk analysis  
I.P. Leistikow, K. den Ridder

13 PRISMA: an instrument for structured reactive analysis of incidents  
P.M.J. Reijnders-Thijssen

14 Benchmark/comparison indicators: instruments to measure and compare quality and safety of care

G.E.M.G. Storms

15 Bundles

S.M. Smorenburg

16 Rapid response teams

E.F. Salm

17 The time-out procedure

W.D.M.H. Roos

18 Operating room debriefing

J. Jurriens

19 Crew resource management

F. Bleeker, F. Remmerswaal

20 SBAR: a framework for safe communication

R. Trooster

21 Multidisciplinary team training of health care  
professionals in a medical simulation centre

S.G. Oei

## **Chapter 1. What is patient safety?**

**Susanne Smorenburg, Job Kievit, Jannes van Everdingen, Cordula Wagner**

Safety in health care can be improved and important lessons can be learned from other public sectors. What makes the safety issue in health care more difficult is that the boundary between avoidable and unavoidable adverse effects in medical practice is a grey area. Incidents, errors and other shortcomings in the care process are not the only source of risk of health loss in medicine. Diseases and disorders, whether in combination with comorbidity or not, bring with them significant (inherent medical) risks. Medical interventions too, even carried out perfectly, are not without risk. It is the task of the professional, from his expertise and understanding for the needs and wishes of the patient, to make responsible decisions and choices. Doctor and patients are aided by disciplines such as evidence-based medicine, medical decision-making and Technology Assessment, and guidelines.

Patient safety focuses on other risks, on the (potential) loss of health that is related to incidents, errors, communication disorders and other failings in the care process. These process risks are often insufficiently considered in the inherent risk calculations mentioned above. That the shortcomings in health care practice can lead to dramatic and unnecessary loss of health is a good reason for putting this subject, which has been clearly underexposed for a long time, back into the spotlight. In doing so, it is important to bear in mind the above-mentioned distinction; if we fail to do that, then patient safety could become all encompassing and thus an empty concept.

Safe care, therefore, is not the same as risk-free care, but means eliminating the risks resulting from human, technical and/or organisational inadequacies in the process of delivering care as far as possible. The challenge lying ahead of us is therefore to practice our work without creating public expectations that all risks can be completely eliminated. That is the real challenge, which will gain force if we keep a clear focus. Patient safety must not be reduced to the umpteenth hype, it is far too important for that.

## **Chapter 2. Patient safety from an international perspective.**

**R. van der Sande, J. Mintjes, W.H. van Harten**

If we look back at the last five years, we can conclude that the publication of the report 'To Err is Human' has led to activities at a national level in many countries. The type of activities developed are naturally closely linked to the system of health care and the role of the government within that system. For example, the United Kingdom has a health care system that is organised regionally but the national government retains a great influence and the management and control rest for the most part in the hands of the Minister of Health and the local NHS Trusts. It is then not so surprising that the United Kingdom has a national institution run on government funding while in Australia, the United States and Canada, with a much more limited role for the national/federal government, many activities are undertaken by private organisations. The activities of the Australian government and the Australian Council for Safety and Quality in Health Care, for example, are especially focused on initiating and funding private activities and the activities of local authorities, and promoting changes in culture and collaboration (such as setting up the Centre of Research in Patient Safety). The role of the federal government is also limited in the USA, although the Department of Health (and its research agency AHRQ) and the Department of Veteran Affairs (with its own patient safety program) do make a significant contribution. And although the legislation regarding a national report system is a matter for the national government, the majority of the current initiatives in the United States also originate from private institutions (including hospitals) and organisations as JCAHO and LeapFrog.

Although the differences between the countries mentioned are considerable, there are some striking similarities.

In the first place, in countries that have coordinated national activities a different form of baseline assessment is always carried out, namely an assessment of the extent of the safety problems in their own country. The question is, however, whether it is the findings of the study or feeling of urgency on which the study was based that spark off the action taken. It is namely striking that, regardless of the extent of the safety problems found at baseline, national activities were always initiated. However it may be, the countries that have so far been the most active do share the same feeling of urgency.

Moreover, in the countries mentioned here there are ongoing discussions on how to deal with the issue of responsibility and whether and if so which legal changes are needed. Denmark is clearly the forerunner here with its Act on Patient Safety, although the discussions are continuing there too on the precise line between indemnity from legal proceeding/sanctions and full immunity. That the protection of informants needs to be guaranteed in one way or another is clear from all the doubts about the British report system that regularly appear in the professional literature. In other countries, too, there are discussions about whether all the activities to promote public safety should be bundled together under one coordinating body. The discussion on this point is on the question as to which organisation and which groups should take the lead here, but also as to who should be responsible for what. In the United States, a few weeks after the publication of 'To Err is Human', the Clinton Administration announced that a national institute would be set up to conduct research into and give advice on the safety and quality of health care. This centre, the study centre of the Department of Health, the AHRQ, has only achieved part of its goal, partly because the Bush Administration has given Medicaid and Medicare Services an important role in the management of health care. The profession does not have sole responsibility in any country,

although in countries as Australia and Canada it does fulfil an extremely important task in initiating and implementing activities.

The lesson to be learned here is that improvement in the safety of our health care requires great efforts from both the professionals (as main initiator) and from the Dutch government. Good insight into the nature and extent of the adverse events is thus indispensable and requires a reliable system for the registration of these events. Clear legal support and a good division of the responsibilities between the professionals and the government will prove to be the main obstacles in the coming years. Practical ways to promote safety on the work floor are discussed in the following chapters.

### **Chapter 3. Why are hospitals not as safe as we would like them to be?**

**Jannes van Everdingen, Harry Molendijk, Wim van Harten**

A hospital is by definition an unsafe place. People who make an appointment in a hospital have a good reason for doing so. There is something wrong with them and they usually have to undergo a diagnostic procedure or therapeutic intervention, which is associated with a potential risk. The question of safety becomes an issue. A guarantee about the outcome of the care cannot be given beforehand. Coping with uncertainty and taking risks is one of the essential characteristics of medicine. It is obvious that in a sector where many risks are taken, the line between life and death is paper-thin and that medical errors can have enormous consequences. A comparison is often made between safety in other sectors where risky events take place and mistakes can have far-reaching consequences, such as air travel, the transport sector and the (petro)chemical and nuclear industries. There are many parallels in these comparisons but also many differences.

Care providers make mistakes, probably quite often, as has been shown by post-mortem studies, for example. In about 30% of post-mortems, the diagnosis is missed or a wrong diagnosis is made. Why are so many errors made in medical care, what are the reasons behind these errors and why are they not corrected in time?

It is natural to assume that there is a relation between the enormous progress that has been made in medicine and the increased risk of errors. The rise in the average age of patients leads to a greater vulnerability, all the more because older patients often present with more than one disorder, the phenomenon of increased comorbidity. In addition, medical treatment has become much more complicated because of the vast amount of knowledge we now have and the increasing numbers of professionals who are involved in one treatment. Add to this the ever-growing influence of technology, where the human-technology interaction is known to be one of the risk areas for safety. And finally, increasing attention should be focused on the collaboration and handover moments that are needed between departments and disciplines. This complex of factors means that by definition there is an increased risk of safety hazards.

There are many human factors that can induce errors, such as lack of knowledge, lack of experience, carelessness, inflated egos, clumsiness, pressure of work, being in a hurry, impatience, lack of sleep, conflicts, a tense atmosphere, jealousy, competitiveness and poor communication. Also the unpredictability of the disease and the way in which the patient responds to the disease play a significant role in the occurrence of errors. A wrong diagnosis is usually not the result of a rare disease, but of an atypical presentation and course of a very common disease. Moreover, medical studies prepare doctors to work competently but not safely. Hospitals are not designed, built or equipped to guarantee the safety of patients during their treatment. The same applies to the design of the care itself. All these factors contribute to hospitals not being as safe as we would like them to be.

In this chapter we will try to show why initiatives to improve safety in health care often work well but then again often do not have the desired effect.

## **Chapter 4. The epidemiology of medical errors: do we know what we are measuring?**

**R.W.M. Giard**

In the previous chapters it has been made clear that patient safety deserves continuous attention: it is both an underestimated and a structural problem of medical care, not just a smattering of incidents. It is important to do research into frequency of errors for various reasons. How often are errors actually made? What are the differences in frequencies of errors between doctors, hospitals, areas or countries? What can we find out about the causes of errors? Have the measures that have been taken to improve patient safety led to an actual effect in the sense of less iatrogenic damage and less victims?[1,2] Meticulous and systematic research of medical practices is necessary to answer these questions.

Now that doctors are increasingly being asked to clearly demonstrate the quality of medical care, utilizable and reliable data need to be presented so that responsibility can be taken.[3] A number of important methodological issues are associated with studies into professional errors. How to define a medical error? How to develop a tool to measure this problem in studies? How accurate and reproducible are the findings of such studies? How can errors be classified according to severity and what is the clinical significance of incorrect medical practices? How to interpret the results of a study into errors? A satisfactory answer must be found to all these questions before we can get down to the matter in hand – reducing the number of medical errors. [2]

Gathering data on medical errors should never a goal in itself, but always a means to achieving this goal of better and especially safer care. In this chapter, we will discuss a number of these methodological problems around epidemiological research of errors. There is a great tendency to consider all medical errors to be unacceptable, but that is not very realistic. Is ultra-safe care feasible?[25] In epidemiological research into errors, the objective is not only descriptive but also normative. To be able to judge whether the care meets the requirements, a norm needs to be established. Are the requirements clear and assessable? What is feasible for the upper limit for medical performance? To find an answer, both observational and experimental studies are needed and our standards for medical practice need to be directed by scientific evidence.

The crucial question is: what can we learn from the epidemiological data on medical errors and how can we use these data to make health care safer? Here we return to the question whether we give the priority to measuring the outcome or the process. The uncertain relation between processes and outcomes makes outcome assessment less easy to use as a tool for measuring quality. The greatest benefit seems to be achieved by process assessment, but that requires a medical-technical analysis as well as a broad organisational approach.[14, 25] We do need systematically collected data on the outcome of medical interventions to be able to evaluate the effect of improvements in processes, but the methodology for doing this is still in its infancy.[13, 14]

The media get very excited when it comes to shocking figures about medical errors but such publications cause an unfounded loss of confidence in doctors which results in irritation and frustration on the part of the professionals.[3] Accountability means that performances are assessed against a norm, so the first step in this process is to set standards by means of evidence-based medicine. Although efforts may be expected, the complexity of today's medicine means it will be a difficult task.[26] Will less errors be made if the approach to patient safety takes a

different tack? That would have to be a rational choice which will require diverse empirical studies and surveys into the current obstacles on the road to maximal safety.[1, 2]

## **Chapter 5. The safety management system, the approach at the organisation level**

**W.H. van Harten, W.M.L.C.M. Schellekens, J. Kievit, S.M. Smorenburg**

The CEO of Shell-Nederland, special representative in the field of patient safety, for the Minister of Health, Welfare and Sport (HWS) for the national hospital improvement program “Faster & Better”, advised in his report, “Hier werkt men veilig, of hier werkt men niet” [Here you work safely or you don’t work at all] in 2004 that hospitals should introduce safety management systems, similar to those at high-risk companies like Shell. In his response to this recommendation, the Minister indicated that the safety management system (SMS) will become mandatory in a few years. The requirements to be met by the SMS were not further specified. This chapter briefly examines the definition, general features and most important components that make it all into one system.

Using the building blocks for a safety management system described in this book, a stepwise introduction plan can be developed to create the right culture and structure and to ‘turn’ the safety circle. Various entrances can be chosen for this. A start can be made with matters for which it is known that care becomes safer, such as reducing decubitus and wound infections and promoting the proper care, for example, with heart failure: “do what we know!”. This also includes swift taking over successful “best practices” from the literature and practice. The major advantage is that this rapidly provides appealing results (“low hanging fruit”). One can also opt to choose a single clear primary issue, e.g. pilots with decentralised reporting via PRISMA or other methods, or medication safety, and to start with hospital-wide improvement in prescribing, distributing and administering drugs. Parallel to this, work can be performed on improving the identification of various risks of unsafe care (complication registration, indicators, introducing VIM, complaints registration) and culture change. In this way, promoting patient safety becomes a normal part of daily work and is removed from a threatening atmosphere.

As soon as there is a plan of action with a sufficient support among management and professional staff, the skill is to stay on course and to further develop the system. Discussing the plan with relevant stakeholders (such as the Staff Council, patient advocate council and Supervisory Board) may contribute toward a broadening of the support base.

All things considered, the description of the SMS and its introduction do not seem to be very complicated. Like introducing quality management – as the organisation becomes larger – simply making a start and continuing a visible effort are the most important; it is not that difficult, but it has to be done! You will find the ingredients for this in the following chapters.

## Chapter 6. Patient involvement

### P. Walsh

This chapter is about patients, and how their actions and attitudes can improve safety. It will concentrate on ‘tools’ or ‘initiatives’ which are focussed on the role of patients themselves making a contribution to improving their own, and potentially fellow patients’ safety, and on developing a culture which is more conducive to improving patient safety. In a recent study of this topic it was found that there is relatively little research or evidence on the effectiveness of such measures, despite health care systems across the world commonly proclaiming the importance of ‘patient empowerment’. Clearly there is a need for more, but there is no shortage of existing or potential initiatives. Necessarily, the nature of the existing evidence is often not so scientifically robust as other studies, and will include qualitative research and ‘expert opinion’. Nonetheless, it would be wrong not at least to take stock of the current state of play and raise awareness of what can and perhaps should be done in the future.

We will look at four kinds of ‘tool’ or ‘initiative’ mainly from the United Kingdom:

- for empowering patients to make patient safety interventions
- for eliciting reports/information from patients on patient safety incidents
- for involving patients in patient safety work more generally
- for the development of a culture which is more conducive to patient safety – a ‘patient safety culture’.

There is relatively little research evidence on the efficacy of patient interventions on improving patient safety or preventing errors. Coulter and Ellins provide a useful summary of such evidence as they were able to find.<sup>1</sup> Yet, there appears to be fairly widespread agreement that the empowerment of patients to intervene in or even to manage their own treatment can both help improve safety and is the right thing to do in principle. Anecdotal evidence from the National Patient Safety Agency (NPSA) also suggests that the wider involvement of patients in identifying risks and solutions has beneficial effects.<sup>2</sup> In this section we look at some examples of tools / initiatives for supporting such empowerment or involvement of patients. The examples given here are not exhaustive. They are intended to stimulate discussion as to what should be tried and tested with further research.

Hand hygiene

Diagnostic imaging/tests

Decision-making

## **Experiences and results achieved**

Patient reporting of incidents

Involvement in planning

Patient safety culture

## **Advantages and disadvantages**

Systems for awarding compensation following clinical errors or negligence is a recurrent theme in discussions around creating the right patient safety culture. In some circles, particularly amongst health professionals, the concept of ‘no-fault’ compensation schemes has become popular. The same enthusiasm is not necessarily shared by patients groups or States. ‘No-fault’ compensation schemes as opposed to litigation through the courts are seen as part of a ‘no-blame’ culture. The theory is that injured patients will find it easier to get some compensation whilst health professionals will not feel so threatened or afraid to report incidents, and avoid adversarial and costly court actions. However, when the English chief medical officer’s working group reviewed these ‘no-fault’ compensation schemes for his report Making Amends, the idea of a no fault compensation scheme for England was rejected.<sup>9</sup> It was found both that existing schemes were not strictly speaking ‘no-fault’ (in that they still required establishing that an error had occurred) and that they had down sides in practice. For example, given the huge scale of estimated medical error which currently goes uncompensated, the cost to the State of making compensation so readily available may not be affordable. Also, most schemes looked at involved some form of capping or tariff system for compensation. Patient groups such as Action against Medical Accidents pointed out that whilst this might mean some people who might not otherwise have received compensation would get some, it would not necessarily be what patients or their families needed or deserved. Consequently, some of the most needy and deserving cases might be ‘short-changed’ by such schemes. There were also points of principle raised such as whether people should be ‘compensated’ if there had been no fault. Some patient groups responded that patients in this situation just wanted appropriate good quality care. On the other hand, research conducted for Making Amends confirmed what Action against Medical Accidents had always said – that what matters most to patients who have suffered as a result of negligence is assurance that errors have been recognised and acted upon. Simply allocating money on a ‘no-fault’ basis, without admission of negligence, would not meet that need. The resultant legislation in England, the NHS Redress Bill, instead sets up an NHS Redress Scheme as an alternative to litigation for smaller clinical negligence claims. It is an administrative scheme run by the NHS itself, whilst still using the legal test for negligence as the courts (but without the rigorous testing of evidence through legal representation or independent adjudication). The proposals have been heavily criticised for their lack of independence and failing to use an alternative test for qualifying for compensation or ‘redress’ than the courts. (Such a test invariably leads to pressure to identify individual negligence and ‘blame’). The government rejected the suggestion that the approach adopted by Denmark could be a better model for an administrative scheme. The Danish Patient Insurance Association runs an administrative scheme which is not a ‘no-fault’ compensation

scheme and does not use the legal test of negligence, and is independent. Administrative schemes of different types also exist in Finland, Sweden and France. Unfortunately, there is very little research evidence as yet as to the effect of these different schemes on attitudes / culture of patients and health professionals. Research in this area would be useful in helping identify the best means of providing for compensation where it is due, whilst developing a genuinely 'open and fair' patient safety culture.

## **Chapter 7 Patient safety culture: assessment instruments**

### **Solvejg Kristensen & Paul Bartels**

Since the 1980s industries as well as researchers have paid a great deal of attention to the role of organisational and cultural factors as antecedents to accidents occurrences. Evidence was found that organisational and cultural factors were underlying causal factors of accidents and the 1986 Chernobyl disaster triggered the fusion of the two concepts of safety and culture (1).

It is an acknowledged fact that within organisations where operations may involve risk for staff or public, it is helpful to consider that there is an organisational culture specially related to safety - a safety culture. Within health care neither a common definition of patient safety culture nor a common view of the dimensions/components of safety exists. But basically there is an agreement that a safety culture is “the way we do things around here, our approach to risk management and the way we think and behave in response to risks in our healthcare environment”. The European Society for Quality in Health Care in 2006 defined culture of safety as: “An integrated pattern of individual and organizational behaviour, based upon shared beliefs and values that continuously seeks to minimize patient harm, which may result from the processes of care delivery.” Focus of the works of patient safety has shifted over the time from investigation of the epidemiology of adverse events and introduction of innovations aimed at prevention to investigation of shared attitudes, beliefs, values and assumptions that underlie how people perceive and act upon safety. It is thought important to grasp these shared characteristics to initiating fundamental and sustained changes to patient safety.

Assessing safety culture is a process which can contribute to positive culture changes – If the first results are used well they will form the basis platform for possibility of a continuous patient safety improvement process provided that the process is wanted and cared adequately for. All instruments have limitations in their scope and ease of use or in terms of their scientific properties.

It is most advisable to choose the method and instrument carefully according to the organisations resources, aims, needs, other patient safety and quality improvement activities.

Patient safety culture is a complex multi-dimensional phenomenon. Obtaining a holistic understanding of such complexity only by using quantitative methods is limiting. By means of triangulation between different methods, such as observations, interviews and questionnaires a deeper understanding of patient safety can provide the basis for improvement initiatives.

A recent study of methodological diversity to improve scientific knowledge and to increase the effectiveness and tailoring of strategies aimed at improving patient safety found, that qualitative approaches should be used in studying patient safety as a complement to - not a substitute for - quantitative approaches (21).

## **Chapter 8. Move your dot; example for improving patient safety**

**L. Touwen, M.A. Tervoort, H. van Dijk, M. Orsini**

Within the framework of Pursuing Perfection that was introduced by IHI (Institute of Healthcare Improvement) in the U.S.A., we became acquainted with the Move Your Dot methodology developed by the same organization to measure, evaluate and reduce hospital mortality. Brian Jarman presented the Hospital Standardised Mortality Ratios (HSMR) analysis for American hospitals. Each dot represents a hospital. In the American situation, the hospital mortality figure (standardised for age, sex, race, payer, admission source and type) is compared with charge per admission (standardised by age and diagnosis). Figure 9.1. shows a great variation in mortality among hospitals: the risk of dying in one hospital may be three times greater than in another. Visiting a reputable, expensive hospital or an inexpensive hospital has no influence on mortality. This standardisation approach shows that hospitals score 'at random'. This study was the starting point in developing improvements for the mortality figure using the "Move your dot" model. We will show you the results for part of our own hospital (Reinier de Graaf Group, Delft, The Netherlands (RdGG) later on.

In quality care, properly dealing with the four items of miscommunication, scheduling errors, adverse events and non-response to a question is critical: what is important is not so much the personal errors but tracking errors in the system, learning from them and improving. After they have been detailed, the recommendations should result in a reduction of mortality by improving care. The procedures will be improved. There will be more attention for the patient. The hospital stay will be shortened. This will result in greater admission capacity, allowing more internal medicine and gastro-enterology patients to be admitted to the internal medicine departments in the locations of the Reinier de Graaf Group. The financial outcomes will improve. Justification toward society via the mortality performance indicator will take shape. The complication registration of the internal medicine/gastro-enterology group will become part of the fixed procedures and serve as a new source of information that may also result in improvement.

As a result of the title: a medical technical performance indicator such as hospital mortality figures should be translated by the organisation by internal analysis to the patient centrally; the title is a statement by a patient from this group and illustrates the vulnerability and weakness of these people. These are the people for whom we do this work. We should think in detail and ask the patients what we have to do to protect them against the repercussions of miscommunication, non-response, scheduling errors and adverse events or errors.

## **Chapter 9. Trigger tool and study of medical records: instrument for detecting adverse events**

**S. Smorenburg, C. Wagner**

A 'trigger tool' is a screening instrument with which adverse events (harm to the patient owing to the manner in which the care is provided) can be found efficiently and quickly (see [www.IHI.org](http://www.IHI.org)). The trigger tool is a list with signals (triggers) that are an indication for unintentional events or unintentional outcomes in a patient.

An example of a trigger is the presence of vitamin K on the medication list. This is an indication of potential haemorrhagic complications in the use of vitamin K antagonists. Based on this indication, an investigation can be made as to whether harm has indeed occurred – regardless of whether it is avoidable or not, caused by the care process. In this example, in finding vitamin K an investigation is made as to whether there are indications for a haemorrhagic complication; only giving vitamin K, for example, with a prolonged INR, without indications for haemorrhaging, is not counted as an adverse event as such. There are various trigger tools: trigger tools geared to harm due to medication (adverse drug events), adverse events in the ICU, adverse events at other specific departments, such as surgery and gynaecology and adverse events in certain care processes such as thrombosis/haemorrhaging.

Although incidents and errors in the care process can also be found through reporting systems, it is known that far from all incidents are reported. Moreover, fortunately, many errors in the care process do not usually result in harm to the patient. On the other hand, some harm to the patient is not recognised as avoidable and caused by an incident.[6] With the trigger tool, the focus lies on detecting and quantifying (avoidable) damage to the patient (outcome). Based on the damage found, an evaluation is made on the underlying basic causes and whether and how they can be prevented in future. As such, the processes and projects that should receive priority in improving patient safety can be determined efficiently. The trigger tool can also be used as a measuring instrument to quantify longitudinally whether improvement actions have resulted in safer care.

A potential disadvantage is that the screening and the assessment take time. All the more so, because the assessment should ideally be made by two individuals independently, since agreement between health care professionals is usually low.

## **Chapter 10. Bow tie model; instrument for risk analysis**

**P.C. Wierenga, L. Lie-A-Huen**

The Bow Tie model is an instrument to systematically and efficiently acquire a complete picture of risks, prevention and recovery measures of a process or a number of processes simultaneously. It can be used to improve medication and patient safety. The model is unique because risk factors, preventive and recovery measures are unified in a single model (figure 10.1). A bow tie can literally be recognised in the model. Centrally placed in the model is the so-called 'Critical Event': an adverse event or situation that can result in harm to the patient. The left side of the model includes various risk factors for the appearance of a specific Critical Event; the right side includes all the possible consequences (harm). These consequences range from 'no consequences' to 'fatal result' for the patient.

Preventive measures are the 'defence barriers' and prevent a risk factor from becoming a critical event. On the right side, recovery measures prevent damage and/or reduce its severity. Each barrier has a certain effectiveness, which again can be reduced by degrading factors.

The pros and cons of a bow tie analysis are diverse. Advantages are:

Easy to understand and provides a clear picture of how risks, safety measures and consequences are related

The instrument is characterised by a systematic approach

Pro-active since a complete picture of a system can be acquired with accompanying risk factors and weak spots without having to focus per se on incidents reported. Improvement projects can be initiated on this basis.

Reactive since incidents can be analysed using the instrument. By explaining incidents based on the Bow Tie, an idea can be acquired of the preventive measures that have worked insufficiently or what the causes might be.

Versatile. The instrument can be used for risk analysis, assessment, auditing and incident analysis.

Can form the basis of a safety management system, since a good risk analysis is the foundation.

Improvement priorities are difficult to make without a risk analysis.

Some disadvantages are:

The method probably offers insufficient possibilities when a sub-process has to be investigated in detail. Adding a method such as FMEA may then be desirable.

A moderator with knowledge of patient safety principles is necessary for the Focus group sessions. Take into account that it will be difficult to arrange one or more group sessions with sufficient participators due too busy agenda's.

## Chapter 11. Health Failure Mode Effect Analysis; instrument for proactive risk analysis

**P.M.J. Reijnders-Thijssen**

Failure mode and effect analysis (FMEA) as a risk methodology was introduced at MAASTRO (MAAStricht Radiation Oncology) CLINIC in 2003. This method of risk analysis is also referred to as the prediction risk technique. The method is derived from NASA and was created in the 1960s.[1] Nowadays, the methodology is widely applied in various large car factories. The FMEA focuses on preventing deficiencies, improving safety and increasing customer-friendliness within an organisation. Since 2003, a version has been available on the American net, the HFMEA, the health care failure mode and effect analysis.[2]

([www.patientsafety.gov/HFMEA.html](http://www.patientsafety.gov/HFMEA.html)) This version is deployed at MAASTRO CLINIC.

The following activities are part of an (H)FMEA [3]:

- recognising and evaluating a potential failure of a product or process and analysing its effects;
- identifying actions that ensure that the risk of the appearance of the failure is reduced or removed;
- documenting the process.

Potential failures are calculated by multiplying the following factors.

The severity risk: the consequence of the potential error.

The risk of occurrence: the frequency risk that the error will appear.

Multiplying these factors creates the risk priority factor. This factor determines the action level.

The (H)FMEA is then implemented in the following 10 steps:

- examine the process;
- brainstorm about potential failure modes;
- make a list of causes that result in the failure;
- add a severity ratio;
- add a frequency ratio;
- calculate the RPN: risk priority number;
- does it concern a system error, is there a monitoring procedure and is the error detectable;
- prioritise the actions for the failure modes;
- take action to reduce or eliminate the high risk modes;
- calculate the renewed RPN after the actions have been implemented.

The FMEA and the specially adapted HFMEA methodology are easy to apply within a health care institution such as the radiotherapy at MAASTRO CLINIC. The fact that space, time and resources must be made available to implement this method properly is subordinate to the advantages reducing risk.

The method is easy to apply, requires very little training and has a thorough structural process analysis.

This method must also be seen as a pro-active quality improvement.

Measures are taken not through registered process deviations and/or patient incidents but for the process deviations.

## Chapter 12. Root Cause Analysis: instrument for reactive risk analysis

**I.P. Leistikow, K. den Ridder**

Systematic Incident Reconstruction and Evaluation (SIRE) is a structured way to reconstruct (what happened?) and evaluate (why did it happen?) an incident.[1] The objective is to answer the question: how can a similar incident be avoided in future? SIRE accommodates the need to learn from incidents and to take concrete and practical measures to lower the risk that similar incidents can recur.

SIRE, also known as Root Cause Analysis (RCA), has been used successfully in aviation and industry for decades and in health care since the end of the 1990s. The methodology is carried out in steps, is multidisciplinary and the question of guilt is irrelevant. The root causes are sought until they can be assigned and the overall objective is to prevent the repetition of (similar) incidents. The philosophy behind SIRE is that humans will continue to make errors but that something can be learned from these errors so that they will be discovered or caught on time in future before they lead to harm.

The purpose of this chapter is to acquaint the reader with SIRE and explain how SIRE is currently applied in the Netherlands. It is advisable to attend a SIRE training course or to read the book, “Patient safety; Systematische Incident Reconstructie en Evaluatie” [Patient Safety; Systematic Incident Reconstruction and Evaluation] or a book on RCA before using SIRE.[2]

SIRE consists of seven steps:

- Collect information; the investigator collects as many facts as possible on the incident;
- Organise the information; the investigator creates an overview of the incident so it can be seen as a film before one’s eyes;
- Define the research area; the investigator decides where the research will be focused and defines the limits of the research area;
- Identify causes; the investigator identifies the causes and influencing factors that made the incident possible
- Devise safety and quality improvements; the investigator devises useful and feasible recommendations to avoid the repetition of similar incidents;
- Report; the investigator writes a concise report of his findings and recommendations based on which third parties (e.g. management) can take conscious decisions;
- Complete; everyone who was involved with the incident and/or SIRE is informed about the result.

SIRE provides an objective description of the incident investigated and the basic causes and influencing factors that played a role in it.[4] SIRE thereby offers the people involved in the incident insight into all factors that contributed to the incident: their own role, the preceding steps, the further development and the influence of their actions. This insight is then placed within the context of that moment. Therefore, SIRE does not stop as soon as it is discovered what has gone wrong. It investigates why such a decision was made at that moment or why a specific action was taken. What should have been done differently at that time to keep those involved on the right path? With this insight, the individuals involved, supported by the SIRE investigator, can devise useful and practicable measures to prevent a repetition of similar incidents.

SIRE not only offers recommendations for measures to prevent similar incidents, but also contributes to employee insight into incidents in general. Employees who are involved with SIRE will thereby become more “error-wise”. They will be able to detect the foreboding of an incident sooner and change course to prevent that incident. Moreover, they will be in a better able to understand the pathophysiology of an incident. As a result, they will feel more comfortable talking openly about errors and unsafe situations.

A third benefit is that SIRE generates data on the causes of incidents. These data are easy to transfer to existing classification systems and can be made accessible for research by using a database.

Against these pros, there are also some cons: first, SIRE requires a considerable time investment, in the second place is not every employee suitable to carry out a SIRE. The SIRE investigator must be steadfast to continue to ask questions, even with difficult people. Analytic ability, a constructive critical attitude and writing skills are also essential. Clinical experience is an advantage, but does not appear to be necessary. And finally, although common sense leads one to believe that SIRE contributes toward improving patient safety, it has not yet been scientifically demonstrated. This is currently under investigation at UMC Utrecht.[5]

## **Chapter 13. PRISMA: an instrument for structured reactive analysis of incidents**

**P.M.J. Reijnders-Thijssen**

PRISMA stands for “Prevention and Recovery Information System for Monitoring and Analysis”. In the 1980s, Van der Schaaf, of the safety management group of the Technical University of Eindhoven in the Netherlands, on assignment from Exxon Rotterdam, developed an instrument that unequivocally structures and classifies reports of “near misses” (near-incidents), based on causes and context variables.[1] Van der Schaaf assumed that the safety position of a company can best be improved by dealing with the sources of errors. This process approach is very similar to the “quality programmes” that are applied in many companies. It is not ‘the person who makes the error’ that must be dealt with, but the situation that the person is brought into to make the errors. By comparing the models from the chemical and steel industry, a model was developed that could be applied in health care. The model appeared for the first time in health care in the mid-90s through the Catharina hospital in Eindhoven. The model separates technical, organisational and human factors within the error analysis.

Due to this more in-depth analysis of causes, there is a better quantitative and qualitative insight into potential incidents. PRISMA makes it possible (through a classification system) to draw conclusions from an entire collection of incidents, instead of from a single individual case. The relationship between a certain basic cause and the accompanying countermeasure is based on a theory, not on an assumption. PRISMA provides a well-organised summary of investigated incidents and clearly describes the connection between context variables and causes on a single page. The organisation can be continuously informed about the ability to control known risks. Using the system, information can be provided to management (decision-making) and the client board (justification).

According to PRISMA, the time investment per report processing is an average of 10 minutes, in which both the causal tree and the classification of the basic causes are made.

In addition to these data, a link will have to be made with context variables for each basic cause. These context variables ensure that, with the periodic data analyses, the PRISMA data are linked to the circumstances under which the incident or the incidents have taken place. If PRISMA data are compared between organisations, it is very important to designate the context variables unequivocally and uniformly. Only then can targeted measures be determined.

## **Chapter 14. Benchmark/comparison indicators; instrument to measure and compare quality and safety of care**

### **F. Storms**

Indicators are developed to measure the quality of care, where patient safety is a component. These are quantifiable components of the care that clarify something about the care as a whole, particularly how it performs compared with a standard or other care providers. In the first case, performance is expressed in percentage of the optimum, while in the second case, it is compared with other service providers in care. In this way, a comparison is also referred to as a “Benchmark”.

A distinction is made between structure, process and outcome indicators. Structure indicators describe whether the infrastructure and personnel are sufficient to provide good care. The environment particularly concerns facilities (e.g. ICT), equipment and workspace. This is well-defined for some forms of care (e.g. structure report of the Netherlands Diabetes Foundation for diabetes care)[1], but there is a lack of consensus on the ideal structure for the care. Process indicators describe whether things have been done that should be done to provide good care. One example is the percentage of patients who are treated by a diabetes team in which blood pressure is measured in a certain year. The literature often provides sufficient evidence to define these structural indicators. Outcome indicators say something about the results of the care. With a hernia operation, for example, the percentage of people who are operated on a hernia and do not suffer a relapse within a year is an outcome indicator for the quality of the hernia operation. Most clinical trials focus on outcomes, so defining outcome indicators from clinical evidence is usually possible.

It is clear that these indicators for patient safety have a clear objective: with external assessment, the institution or organisation that receives the report (e.g. Health Care Inspectorate or insurer) will assess and take action, if necessary, for the quality and indirectly the safety. If the indicators are public, the patient himself may choose a care institution with good performance. Publishing data in the U.S., as mentioned above, hardly had an influence on the choice of hospital.

Internal indicators also have a favorable effect for the patient. Here, the data are not public but are used by the care providers for internal consultation and improvement of care.

A major problem with benchmark comparisons is the so-called case mix: can the outcomes be compared since the population is different. For example, with a diabetes population in a centre with many referrals in connection with problems in controlling the diabetes, the average blood sugar will be higher than in a centre where all people from the region are referred. A high percentage of people with social or language problems will also have an unfavorable effect on average blood sugar. There is always a lot of discussion about how to correct for these types of populations that cannot be compared, but usually it is not possible. Usually, the team can only explain whether there are special interpretations for non-optimal performance that lie beyond their sphere of influence, but that cannot be seen in a benchmark, of course. Outcome indicators are almost always affected. In these cases, external justification is dangerous.

## **Chapter 15. Bundles**

### **S. M. Smorenburg**

A 'bundle', derived from the concept that IHI has introduced for this, is a group of precautionary steps with approximate time and space characteristics that, when executed collectively and reliably, has an enhanced effect on patient outcomes. The bundle is based on the hypothesis that when care processes are grouped into simple bundles, caregivers are more likely to implement them by making fundamental changes in how the work is done. When the care processes are evidence based, subsequent outcomes will improve. The bundle is illustrated with an example to clarify the principle.

Application of the 'bundle' appears to be an effective method in reaching a set objective. This is partly due to the fact that one intervention from the bundle helps to remind the care provider of the other interventions from the bundle, so that they are less often forgotten than if they had been implemented separately.

If the bundle is not implemented in a patient (e.g. one of the interventions is nevertheless forgotten), this information is analysed and used to redesign the process, where possible, to improve the chance of a successful application of the bundle.

The goal oriented nature of the bundle also appears to demand development of the teamwork necessary to improve reliability; care providers together ensure that the bundle is applied completely. IHI: 'While most hospitals likely follow some of these steps some of the time, few if any ICUs complete them all of the time. The bundle provides a "forcing function" for teamwork, and this teamwork has led to outstanding results'.

A potential disadvantage is that a limited number of interventions can be 'bundled' and measured as one intervention for its application. This means that choices have to be made about which interventions are considered to be critical in reducing the complication, which means that other important interventions may receive less attention.

## Chapter 16. Rapid response teams

### E.F. Salm

Analogous to the resuscitation teams and the trauma teams, Rapid Response Teams, also called Emergency Intervention Teams (SIT), were established in Australia in the early '90s to treat patients at risk as quickly as possible after they had been recognised as such. These teams consist of doctors educated in treating patients at risk (intensive care specialists, specially trained residents) and experienced intensive care nurses, who help doctors and nurses on the ward to stabilise patients at risk.

Why are the wards “dangerous” for patients with vitally threatened organs? Various studies have shown that disturbance of physiologic parameters in patients admitted to the hospital ward is all too often unrecognised. It appears that approximately 70% of the patients who are resuscitated in the hospital have respiratory or neurological decline in the hours preceding the cardiac arrest, as illustrated in the above example. [1,2] Other studies show that approximately 40% of the intensive care admissions are avoidable and that intensive care admissions from the ward have the highest death rate. [3,4]

The literature provides three important reasons for the problem. First, there is a lack of knowledge among doctors and nurses. During training to become doctors and nurses, little attention is devoted to recognising and helping patients at risk. [5,6] Secondly, it appears that the hospital organisation is not set up for a systematic approach for this type of patient.[7] And finally, poor communication is an important reason for the suboptimal care. To address these problems, a model for early recognition of high risk patients has been developed: a Rapid Response Team (RRT).

A Rapid Response Team contributes toward improving communication between various care providers, changing the culture, educating nurses and doctors and improving patient transport. In implementing the model, it is important for the emphasis to lie on the supporting function of the team. The feeling can easily be created that the RRT is taking over the patient from the original physician in charge, which creates resistance. When the RRT is consulted, the original care providers, nurses *and* doctors, must continue to feel involved in the patient's treatment. Only then does the presence of a Rapid Response Team result in an improvement of the quality of care: for the patient at risk but for other patients in the hospital as well.

## **Chapter 17. The Time-out procedure**

**W.D.M.H. Roos**

Just before starting the surgery, when everyone is ready, the operating room (OR) team conducts a final check with a standardized questionnaire (open questions) to ensure that the right surgery is performed on the right patient on the proper eye. A check that all the required materials are present (implant lens, donor cornea, etc.) and that the patient's health is not in danger by the planned surgery, was added as part of the procedure. All the questions are considered during this so called 'time-out procedure', which takes less than a minute. The time-out procedure augments the regular checkpoints while the operation is being prepared. This ensures that all checkpoints are summarized once again and checked with the entire team just before surgery will start.

The introduction of a safety system can only succeed with the full support of the management and medical staff. It is important to have complete involvement of employees and specialists by the introduction and implementation of the procedure. The system should be simple and easy to keep up to date. Explaining its necessity and communicating the results are also extremely important. The Time-out procedure appeals through its simplicity: it takes only one minute, it is easy to explain and its results are immediately demonstrable.

## Chapter 18 Operating room debriefing

### J.Jurriens

Debriefings are used successfully for reflection on performances of teams in other industries than the healthcare sector (like aviation) (*Berwick, D.M.: Broadening the view of evidence-based medicine. Qual Saf Health Care 14:315-316, Oct. 2005*). They are used to improve interdisciplinary communication and teamwork to foster safety in those sectors. This chapter describes the debriefing tool can also be applied to the setting of healthcare.

Communication lies at the course of many patient safety incidents in the health care sector. Health care is delivered in a complex setting where the composition of teams often varies greatly. It is known that considerable discrepancies in perceptions of teamwork exist in the operating room, with physicians rating the teamwork of others as good, but at the same time, nurses perceive teamwork as mediocre. (*Makary, 2006; 202(5): 746-52;. Thomas EJ, Sexton JB, Helmreich RL, ,Crit Care Med. 2003; 31(3): 956-9*).

Tools have been developed to help teams prevent patient safety incidents, such as briefing sessions before operations (the so-called Time-Out procedure discussed in another chapter. However due to the complex setting and variabilities in patients and the composition of operating teams, incidents will inevitably occur. Operating teams therefore need mechanisms to reflect on the team's performance and identify improvement opportunities. However, most OR teams do not have effective or feasible mechanisms in place do deal with these situations.

The debriefing tool described in this chapter does provide a structured approach to promote effective interdisciplinary communication and teamwork after a patient safety incident has occurred. This debriefing tool is a (postoperative) team checklist aimed at improving future performances of teams or procedures. The focus lies on learning from errors or near misses while discussing the work done by a team.

Operating room debriefings contribute toward preventing patient safety incidents. This tool is easy to understand and easy in use; it is not time consuming. It has an proactive approach to learn from incidents and gives direct feedback on performance, which stimulates learning. Debriefing creates a forum to discuss safety concerns on a regular basis, thereby promoting a culture of safety. It can be applied in the operating room or any clinical area at the end of a procedure or event and can be used as a complement to other communication and safety initiatives. There are also some disadvantages: it's simplicity may provoke resistance in professionals as they do not believe the concept and, although only 2-3 minutes to perform, it may be difficult to have the whole team available for the debriefing

Debriefing can be used as a proactive approach to learn from patient safety incidents. It is a valuable tool that contributes to creating a culture of safety. Debriefing can complement other instruments to improve communication, teamwork and safety. It is easy in use and can result in improvements for future procedures, thereby increasing patient safety in the hospital.

## **Chapter 19. Crew resource management**

**F. Bleeker, F. Remmerswaal**

Halfway through the 20<sup>th</sup> century accident rates due to mechanical failures dropped steeply in aviation. More information became available from accident investigations and it became obvious that most accidents were related to a breakdown of crew coordination, communication, situational awareness and decision-making by the flight crew. At that time the training of aviation professionals focused mainly on technical skills, e.g. the ability to control and steer an aircraft under difficult circumstances.

It was revealed that making full use of the team on board an airplane was the best way of preventing or mitigating the effect of human factor failures. Training courses were developed with more attention to Human Performance Limitation and Crew Resource Management (CRM). CRM in aviation can be defined as the use of all available resources, information, equipment and people to achieve safe and efficient flight operations.<sup>1</sup> In general CRM training incorporates the improvement of communication skills, leadership, teamwork, error management, workload management, situational awareness and decision-making. The following elements, being part of the above-mentioned items, have been identified as particularly relevant to health care. One such element includes the concept of briefings – short synopses of intended actions by the individual in charge. This is generally referred to as establishing a ‘shared mental model’ of the flight and allows crew members to anticipate each other’s needs in a timely manner and to understand their own role in what is to come. Another key element of CRM includes training teams in acceptable ways to challenge the actions of other crew members and to assert safety concerns in a manner that is not only appropriate but expected. A third essential aspect of CRM has been the incorporation of specific behaviours to monitor other crew members on actions that are critical to safety. These are often formalised and require specific actions from specific crew members, as prescribed by standard operating procedures (SOPs).<sup>2</sup> CRM has been cited by both the Institute of Medicine (2001)<sup>3</sup> and the Agency for Health Care Research and Quality<sup>4</sup> as a promising strategy for improving health care quality and patient outcomes. In both medicine and aviation highly trained professionals are the key players in operational processes and in both cases they work in a team with other professionals. For this reason it is rather tempting and maybe efficient for the medical world to acquire the knowledge and experience of aviation in the use of CRM.

Although the principles of CRM are not too difficult, it will take time to broadly implement CRM practices because hierarchic structures, processes and professional cultures, that have been built up for many years, have to be changed. For example, the nurses and junior doctors have to learn to speak up and make sure they are part of the decision process of the senior doctor. The senior doctor should invite other team members to monitor his performance in order to detect errors in progress. For this change in culture to succeed, mutual consensus and involvement of all parties, including management, is crucial and long-term attention of senior staff and management on implementing CRM is essential.

As CRM training and practices focus on optimising roles, behaviour and attitudes in a team, the change in culture could also be used to increase efficiency or to develop and implement process improvements.

## Chapter 20. SBAR: a framework for safe communication

### Roos Trooster

In many avoidable episodes of patient harm, communication failures play a central role. Vague communication about vital signs, lab results, changes in DNR code and medication: it is clear that ad hoc communication in health care can lead to many mistakes. Nurses and doctors are learned different communication styles: as nurses are trained to use a narrative and descriptive style and not to diagnose, doctors are trained to be problem solvers and just want the headlines. Hierarchy and power distances are inherent in medicine and influence the communication between doctors and nurses and between residents and seniors. Although healthcare has become more complicated, with more professionals involved in a team, more shift changes and more hand-offs, communication standards are hardly, if ever used and transfer of care varies from person to person.

Acknowledging this, a standard for communication needs to be established to provide safer care. SBAR is a situational briefing model. It originated in the navy and as a strategy in the military and aviation, where hand-off failures can lead to devastating accidents, as in medicine.

The model has been developed by professionals of Kaiser Permanente of Colorado, USA, and has there been proven effective for hand-off communication between healthcare professionals about a patients condition.

Communication is structured by ‘forcing’ the professional to address the following items in the SBAR-framework, expressing the problem in a clear and brief manner.

- Situation: what is happening? name, unit, patient and reason for calling
- Background: what is the context? admission diagnosis and date, medical history, treatment in brief
- Assessment: what is the problem? vital signs, changes from prior assessments
- Recommendation: what would you like to see done?

It is new to healthcare to improve verbal communication with standard frameworks. This is an important development, given the many adverse events in which communication breakdowns play a role.

SBAR offers a simple technique for getting across complicated messages. Briefly and concisely, critical important pieces of information are transmitted in a predictable structure. SBAR-users also are challenged to make an assessment of the problem and the appropriate solution in their point of view. The receiver knows what sort of information will be given and hears what is expected from the other side.

SBAR is a ‘neutral’ instrument, that dissociates communication errors from the issue of clinical competence and personal failure. It is better to approach improvement from the perspective of using standardized communication tools to keep the patient safe, than to talk about mistakes and personal functioning.

The approach of training a multidisciplinary team in the SBAR technique, models the principles of teamwork and allows for sharing of perspectives.

As human factors engineering is a relatively new science in medicine, it is difficult to measure the effects of SBAR-use. SBAR will often be implemented in combination with other interventions, so outcome measures are hard to subscribe only to the implementation of SBAR. If communication failures can be measured in an objective way, the rate of adverse events due to

miscommunication could be an outcome measure. Also safety culture surveys can be used as a measure for effectiveness.

Process measures such as team training, compliance to the standard and knowledge of the technique can be used as indicators.

Although the principles of SBAR are simple, it will take time to broadly implement communication standards that dissociate from hierarchic structures and differences that have been built up for many years. Historically nurses and residents are hesitant to give a recommendation to a senior doctor, and not all doctors are willing to value such an assertive assessment. This part of the SBAR is crucial however, because it is about psychological safety to speak up and ask for help in the clinical setting. Therefore SBAR is not a stand alone tool and a cultural change is required. This change asks for common agreement from all parties, practice, coaching and actively involving management at all levels.

## **Chapter 21. Multidisciplinary team training of health care professionals in a medical simulation centre**

**S.G. Oei**

There are many avoidable deaths in hospitals because the care team is not well attuned. Training in emergency situations is generally followed on an individual basis. In practice, however, hospital patients are treated by a team composed of various disciplines. To prevent communication errors, it is important to focus the training on the team as a whole, rather than on the individual. Team training appears to be important in contributing toward preventing these errors.[1,2]

A medical simulation centre is an area that reconstructs certain hospital environments, including patient simulations. Individuals and complete care teams can be trained in acute situations in a reconstructed operating room, delivery room or emergency room. Scenarios are simulated for emergency room, operating room, delivery room and intensive care teams. Doctors, nurses, nurse practitioners, physician assistants, midwives and all others working in health care must build up and maintain knowledge and skills during their training. In providing training, the emphasis is on transferring knowledge and learning basic skills. Training focuses more on the practical work and accompanying tasks. Simulations can be used to establish how an individual or an entire team behaves in certain clinical situations and how the other competences, such as cooperation and communication, are developed.[3] Actors who can simulate patients can be used for clinical examinations. For invasive and dangerous treatments in health care, however, only technological patient simulators can be used.[4] Various dummies are available: an adult man, a pregnant woman, a child and a baby. The patient simulators should realistically simulate the illness or disorder and respond interactively to actions by the health professional.

What are the advantages of team training of health care professionals in a medical simulation centre?

- Training of health care teams in emergency situations promotes cooperation and reduces the number of communication errors.[1,2]
- Training in a medical simulation centre offers the opportunity to train rare emergency scenarios under standardised conditions and give targeted feedback on functioning as individual and team.
- Acceptance of team training results in a culture that devotes more attention to (patient) safety.[4]

Against these advantages there are also some disadvantages:

- The costs of introducing simulation training strongly depend on the objective of the simulation, the intended target group and the applied technology. Practicing on personal computers and low fidelity phantoms is relatively inexpensive. Investment in high fidelity patient simulators is substantial, but cheaper than practicing on laboratory animals.[3]

New training curricula will have to be developed for experienced clinical teams. Experienced specialists and generalists in training must reserve time for simulation training at the expense of clinical work. The costs will be considerable since this is currently not provided. Nevertheless, this may not be an obstacle to accepting team training of acute care teams. Diligent simulation training must become part of the work of medical professionals and not remain a matter of secondary importance, since patient safety is at stake.