

Human factors in obstetrics

Stephanie Monks
Kirsty Maclennan

Abstract

The importance of human factors is becoming increasingly recognized in the healthcare profession. Lack of situational awareness, poor communication and inadequate leadership compounded by unfamiliar teams in a rapidly deteriorating clinical situation put obstetric patients at particular risk. There is much to be learnt from other high-risk industries including aviation and the military. Increasing awareness and training in human factors and utilization of communication tools (such as SBAR) and prompts (including emergency checklists) can help to promote a safer environment.

Keywords Communication; ergonomics; error; human factors; multidisciplinary team; non-technical skills; patient safety

Royal College of Anaesthetists CPD Matrix: 1A02, 1A03, 2B05

Introduction

It is a widely held belief that in the near future, the advancement of medical practice will be impeded not by pharmaceutical developments or new surgical techniques, but by our abilities to work as an effective team.

Industries such as aviation have long since recognized the importance of human factor training. Human factor training, in the form of crew resource management training, is mandated for all crewmembers and flight followers by a federal aviation rule. The healthcare profession continues to learn from such industries.

'Human factors' and 'non-technical skills' are areas of patient care that have exploded into medical education, training and the hospital workplace over the last 10 years, particularly in complex fields such as anaesthesia. The acceptance of potential pitfalls such as task-fixation and poor communication have been highlighted in a number of recognized cases, not least that of Elaine Bromiley.¹

Since then, multiple training courses in non-technical skills have been developed globally.^{2,3} These skills are included as part of many medical and nursing college competencies.

There is an ever-increasing acknowledgement of the importance of human factors when working as a multidisciplinary

Stephanie Monks MB ChB FRCA is a Specialist Registrar in Anaesthesia on the North West Rotation, UK. Conflicts of interest: none declared.

Kirsty Maclennan MB ChB MRCP FRCA is a Consultant Obstetric Anaesthetist at St Mary's Hospital, Manchester, UK. Conflicts of interest: none declared.

Learning objectives

After reading this article, you should be able to:

- describe three different levels of situational awareness
- list five core competencies of good team working
- outline SBAR communication

team during handovers and whilst managing emergencies, all of which are constantly encountered in the obstetric arena.

Emergencies on delivery suite can be unpredictable, rapidly developing and life-threatening. This is further complicated by having two patients, (mother and baby), being cared for by an ever-changing multidisciplinary team.

Following on from The Confidential Enquiry into Maternal & Child Health (CEMACH) report,⁴ which listed poor teamwork and communication as contributory factors in poor outcomes, and the Clinical Negligence Scheme for Trusts (CNST) recommendations, simulations and 'fire-drills' have been widely taken up by obstetric units throughout the country. Various courses such as PROMPT (PRactical Obstetric Multi-Professional Training), Maternal AIM (Acute Illness Management), and other local courses^{5,6} have been set up to tackle clinical management of certain emergency obstetric scenarios. However, less emphasis has been placed on the non-clinical elements of safe patient care.

Errors/patient safety

'to err is human' (Alexander Pope, "Essay on Criticism").

Reason (1990) described a Swiss Cheese Model of why errors occur⁷ and methods we can use to prevent them. Each layer of cheese is a level of protection against error, but each layer has holes, also termed 'latent conditions'. Errors can 'slip through' these holes. This could include low staffing levels, unfamiliar environments and poor training.

If latent conditions become aligned over successive levels of defence they create a window of opportunity for a patient safety incident to occur⁷ (Figure 1).

What are human factors?

Human factors, non-technical skills and ergonomics are all terms that are used to describe factors that can impact patient safety, but are not expressions that are easily definable. The International Ergonomics Association Council has adopted the following definition:

Ergonomics (or human factors) is the scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimize human well-being and overall system performance.⁸

These terms therefore encompass a wide range of dynamics, including interfaces between humans, equipment, and the workplace, interactions between team members and also individual behaviours. These latter elements can be thought of in

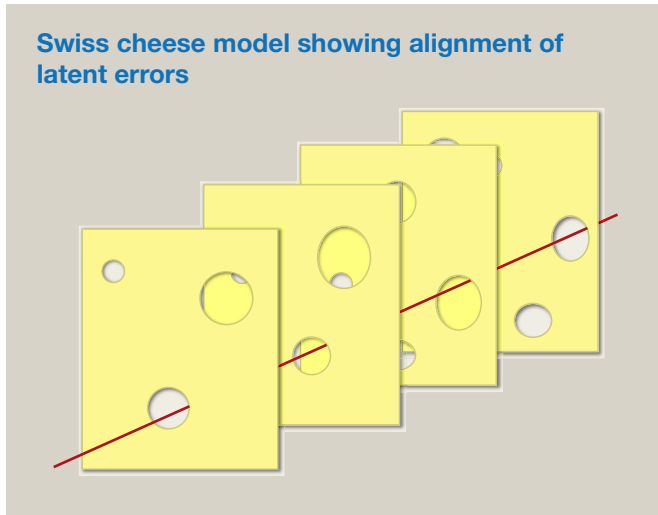


Figure 1

terms of cognitive (situational awareness, decision making) and social (team-working, task management) components.

Why are human factors important?

The aims of studying these factors are to improve patient safety, healthcare professional performance and the environment.

This is one reason why critical incident reporting and analysis is essential in healthcare, as it may help us to implement new or adapt current systems to prevent or reduce future harm.

Russ et al.⁹ describes the importance of human factors awareness (Box 1).

Cognitive elements

Situational awareness describes how we monitor a process; how we notice what is happening, why it is happening, and understand the effects that those events may have.¹⁰ This has been explained by Endsley (1995 – accessed from¹⁰) (Table 1).

There is a limit to the volume of information that a person is capable of registering and processing. This available mental capacity has been termed 'bandwidth'. Delegation of tasks to members of the team helps to clear some of the information thus reducing bandwidth overload.

Orasanu & Fisher (1997) divided decision making into two stages.¹¹ Firstly identification of the problem followed by

The importance of awareness of human factors⁹

- Understand why healthcare staff make errors and in particular, which 'systems factors' threaten patient safety
- Improve the safety culture of teams and organizations
- Enhance teamwork and improve communication between healthcare staff
- Improve the design of healthcare systems and equipment
- Identify 'what went wrong' and predict 'what could go wrong'
- Appreciate how certain tools ... can help to lessen the likelihood of patient harm.

Box 1

deciding on a management plan. Multiple factors, including the experience of the operator and the type and urgency of the situation, will determine the decision-making mode of a clinician (Box 2).

Social aspects

The concept of a team leader in emergency medical situations is often more fluid than in day-to-day work. In cardiac arrests an ideal team leader has been identified as: '*easily identifiable ... with good communication skills, the ability to distribute tasks, gather information and maintain an overview without getting involved in practical tasks*'.¹²

An effective team requires many different qualities, which have been theorized in different ways by many people. One example is the 'Big Five Model'. This suggests five core competencies for good team working¹³ (Box 3).

Another important technique that has been used for many years in the aviation industry is having a shared mental model. To use an obstetric example, a midwife, caring for a hypertensive parturient who commences fitting, activates an emergency alarm.

On arrival of the emergency team, the midwife shares her mental model, 'this is likely to be an eclamptic seizure'. By sharing her mental model, the team are able to rapidly work towards a common goal of providing resuscitation whilst preparing magnesium sulphate to control the seizure.

Use of emergency checklists also help to reinforce a shared mental model.

In order to determine specifically which emergency checklist to use, the leader needs to state the emergency. At this point, it is important that team members feel empowered to challenge this mental model if they have reasons to believe it is wrong. In addition to aiding verbalization of actions by the team, checklists also help to coordinate the activities of the team and reduce steps missed during the management of emergency situations.¹⁴

The ANTS training scheme² for anaesthetists concentrates on the following areas of task management in their observation and rating scale:

- planning and preparing
- prioritizing
- providing and maintaining standards
- identifying and utilizing resources.

Communication

Handovers between staff occur frequently on delivery suite, at shift changes and between different professionals. Poor communication has been highlighted in various maternity reports as a potential causal factor in a number of untoward incidents.

Handover is an essential time when critical information can be missed.

A number of tools have been developed to try and minimize these risks, and use of these tools is a specific criterion in recent Clinical Negligence Scheme for Trusts (CNST) risk management standards.¹⁵ The most commonly used of these is the SBAR tool.¹⁶ (Box 4).

A number of useful communication aids utilized in military and aviation practice are equally relevant to obstetric practice. The use of sit-reps (situational reports) whereby the leader uses

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