Clinical human factors: the need to speak up to improve patient safety


Abstract
This article aims to inspire nurses to recognise how human factors affect individual and team performance. Use of a case study and learning derived from a subsequent independent inquiry exposes the dynamics that can affect teamwork and inhibit effective communication with devastating consequences. The contribution of situational awareness and the importance of nurses speaking up when they have concerns are demonstrated as vital components in the delivery of safe patient care.

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is an emergency. You do not understand why the consultants are not trying other ways to secure the patient’s airway to provide much needed oxygen. It is not at all clear who is in charge.

You leave the room and phone the intensive care unit (ICU), telling them of the emergency in the operating theatre and of the patient’s respiratory distress, and they immediately offer a bed. You return to the anaesthetic room and announce: ‘A bed is available in ICU.’ The three consultants turn to you. No one has spoken as assertively or as loudly as you in the past few minutes. They look at you dismissively, in a way that seems to translate as: ‘What’s wrong? You are over-reacting.’

You are surprised at their response, and start to doubt if you have interpreted the situation correctly. It looks like surgical access is needed, the tracheostomy set is on the side, why are they not using it or even discussing it as an option? You begin to feel uncomfortable under their glare and again doubt your assessment of the situation – surely they know what they are doing. You walk out and cancel the ICU bed.

You learn later that the patient’s condition did not improve and she needed to go to ICU after all. You learn later still that the patient died.

Could things have been done differently? Could the team have responded more effectively? With the benefit of hindsight, this was a ‘cannot ventilate, cannot intubate’ situation, for which there are known and prescribed emergency response procedures. Why were they not deployed? Had the team been more appreciative of one another and their collective contribution to the patient’s care, might the outcome have been different?

**Case study**

The scenario parallels the case of Elaine Bromiley, a vibrant, happy and healthy young wife and mother, who troubled by recurrent sinus problems, underwent anaesthesia for elective corrective surgery and septoplasty on the morning of March 29 2005; an anaesthesia from which she never awoke.

The events and circumstances contributing to Elaine’s death are known from an independent inquiry led by Mike Harmer, former president of the Association of Anaesthetists of Great Britain and Ireland (Harmer 2005). The inquiry provided insights and an opportunity to learn from what happened, and to improve patient safety.

From the report it is known, for example, that Elaine was cared for by an experienced anaesthetist and operating department practitioner, that a thorough pre-operative assessment was conducted and that there were no reported concerns pertaining to Elaine’s planned anaesthesia and surgery. Pre-oxygenation was not indicated and Elaine’s anaesthetic commenced at 8.35am via propofol induction. Once Elaine was sedated, the anaesthetist tried to place a laryngeal mask to maintain intra-operative anaesthesia, but it would not fit as Elaine’s jaw was too tense.

Additional propofol was administered and the mask was tried again, as were different sized masks. Several minutes into the procedure, it was evident that things were going wrong.

Elaine was cyanosed and her oxygen saturation fell to 75%. By 8.39am, four minutes into the procedure, her oxygen saturation was 40%. By 8.41am the anaesthetist abandoned the laryngeal mask and attempted endotracheal intubation. The operating department practitioner, a senior member of the team, put out a call for help, to which several people responded.

Six minutes into the procedure, Elaine’s oxygen saturation was only around 40%. Everything the team tried failed. In the room were two anaesthetists, an ear, nose and throat surgeon with more than 30 years’ experience, two operating department practitioners and two recovery nurses, and every piece of equipment that they could possibly need in such an emergency. A mini-tracheostomy kit was already available and one of the nurses, assessing the situation, had collected a tracheostomy procedure tray. The consultants continued in their attempts to intubate Elaine for 15 minutes, reportedly to the exclusion of any, or all, other options. Elaine remained unconscious; she was transferred to ICU two hours after first going to theatre, and died 13 days later.

**Findings from the inquest**

At the inquest, there was a possibility that Elaine’s death would be attributed to neglect on the part of the individual anaesthetist. Such a verdict would have achieved little, other than to single someone out to blame, an outcome that would destroy the career of a committed professional who was already profoundly affected by what had happened. Too often blaming an individual can narrow the focus of an internal investigation that informs an inquest, resulting in a perfunctory description of what happened to afford explanation to grieving families and interested parties (Green 2004). However, this provides limited exploration of the issues, and superficial understanding of how and why things happened. In Elaine’s case, the verdict was far from brief. The narrative verdict from the inquest provided the basis for an independent inquiry.
Official inquiry findings
The independent inquiry (Harmer 2005) identified that at least one of the operating department practitioners and one of the nurses, and possibly others, recognised that the best course of action was an emergency tracheostomy to secure the patient’s airway, but there was no discussion among the team – the views of team members were not invited, nor were they volunteered. There was reported confusion about how to use certain pieces of equipment.

The aim of the independent inquiry was to establish how and why things went wrong, not who was wrong. It provided an opportunity for further examination of the case and better understanding of the dynamics, relationships and responsibilities of those involved, as individuals and team members. Of equal significance, the system in which staff were working was subject to scrutiny. The inquiry resulted in deeper and more meaningful insights into the factors contributing to Elaine’s death.

The healthcare professionals caring for Elaine were not neglectful, nor were they incompetent; but they lacked an appreciation of human behaviour under stress. Individually and as team members, staff lacked situational awareness of a rapidly deteriorating situation; they failed to recognise what was happening around them, ignored essential clinical information, were overwhelmed by a rapid sequence of events and were blinded to the passage of time. Notable to the inquiry, individuals lost sight of their limitations in an escalating situation and, of significance, senior clinicians failed to embrace the valuable contribution to be made by fellow team members. ‘Rescue’ of any patient in such circumstances was entirely dependent on the healthcare professionals’ capacity to respond differently in a co-ordinated way and to implement difficult airway guidelines (Henderson et al 2004).

Enhancing patient safety
None of the healthcare professionals caring for Elaine had benefited from training to understand and manage their reactions in an emergency situation, either individually or as a team, through simulation such as that which occurs in crew resource management (CRM) training.

CRM is an approach to training that is routine in other safety-critical industries, most notably aviation, and involves the application and appreciation of specific human factors (ergonomics). CRM is, in effect, a management system that makes optimum use of all available resources – equipment, procedures and people – to promote safety and enhance the efficiency of operations (Haller et al 2008, Despins 2009, Livingstone 2010).

Failure to provide such training was a failure of the training system for all the healthcare professionals involved. The findings of the inquiry illustrated that because of this failure there was poor understanding of clinical human factors. Catchpole (2011) defined clinical human factors as a means of enhancing clinical performance through an ‘understanding of the effects of teamwork, tasks, equipment, workspace, culture and organisation on human behaviour and abilities, and the application of that knowledge in clinical settings’.

It is seven years since Elaine died and awareness of clinical human factors is increasing with instances of good practice in their application. The design of equipment to address the human/machine interface is improving and there is increased awareness of the need to design safer healthcare systems. The importance and benefit of training healthcare professionals in non-technical and technical skills is also better documented, with increasing evidence of the accruing benefits of improved interpersonal behaviour and cognitive performance (Yule et al 2006, Mitchell and Flin 2008).

There are more opportunities for healthcare professionals who work together, to learn and train together, through the commissioning and delivery of multiprofessional team-based human factors training. However, routine commissioning of team resource training delivered on an inter-professional basis is far from mainstream.

While there is increasing recognition of what needs to happen to integrate clinical human factors in the NHS, there are still many challenges and questions regarding how this might be achieved. Disseminating best practice to achieve improvement on a wider scale is dependent on system-wide change at both the strategic and local level, but in the interim, it is important to identify the role of the nursing profession and that of the individual nurse.

Clinical human factors and nursing
Returning to the clinical scenario at the beginning of the article, it would perhaps be useful to explore why the nurse felt uncomfortable declaring that she had secured an ICU bed, why she subsequently cancelled it and why no one spoke up and said: ‘This patient needs a tracheostomy now.’

Something that is universally recognised by many working in the NHS, especially nurses, but that is rarely ever discussed or fully acknowledged, is the hierarchical or authority gradient between
and within the professions, and between regulated and non-regulated staff. Effective teamwork is considered the basis of effective patient care (Nestel and Kidd 2006, Catchpole et al 2008a, 2008b), yet the negative effects of powerful established hierarchies continually impede optimal team performance for patients, seemingly on a daily basis (Walton 2006, Reid and Catchpole 2011).

Reducing the potential negative effect of hierarchies by improving communication and positive team behaviours is a key goal of the Five Steps to Safer Surgery integrating the WHO Surgical Safety Checklist (Patient Safety First 2009, National Patient Safety Agency 2010). Harmer (2005) concluded that in Elaine’s case, clinical practice fell below an acceptable level, but even if the management had been different, there was no way of knowing with certainty that the outcome would have been different.

Would staff respond differently if a case like Elaine’s happened today? One might say yes, but only if difficult airway guidelines (Henderson et al 2004) are followed and pre-operative safety briefings are conducted to create the right conditions for constructive challenge, in which speaking up for patients is the cultural norm.

For many, the idea of flattening the hierarchy gradient is challenging and cultural issues may act as barriers; but these challenges as well as the social and historical barriers of the NHS, need to be overcome to achieve safer teams.

Learning and reflection

The focus so far has been on Elaine’s story, but it is important to consider transferable learning for nurses working in other care environments. Perhaps those working in health care can learn from safety procedures employed elsewhere, for example in the aviation industry. By way of illustration, in 1989 a Boeing 737 flying over the UK had an engine problem. The flight crew shut the engine down as per their procedures. It was a tense moment in the cabin, some of the passengers and cabin crew had seen signs of fire from the left engine, they had felt vibration and heard muffled noises that frightened them.

As the crew prepared the passengers for an emergency landing, the captain announced calmly over the public address system, that the problem with the right engine had been contained and that the aircraft was diverting. Some passengers on the flight were disconcerted by this message. Possible queries in passengers’ minds at the time of the incident may have been: ‘The right engine, did he say the right engine? Didn’t we see sparks from the left engine? Is our left his right, because of where he is sitting? Surely the flight crew know what they are doing and have things under control don’t they?’

The independent accident investigation stated that the flight crew did in fact shut down the wrong, that is to say the ‘good’, engine. The ‘bad’ (left) engine had been throttled back slightly, which meant that it ran ‘normally’ for enough time to get the plane close to its diversion airfield, but at the last moment, when more power was demanded of it, the engine failed. The plane glided a short distance, crashing on the M1. Forty-seven people lost their lives (Air Accidents Investigation Branch 1990).

This sort of scenario in aviation, where people knew something was wrong but did not speak up, has been a recurring deadly theme. Black boxes examined from other accidents around the world have highlighted that the hierarchy gradient between the captain and the rest of the crew compromised safety because people were inhibited in speaking up; as a result planes crashed. Of particular concern, even when people knew that failure to speak up would mean the plane would most likely crash, they failed to do so (Dekker 2005). Similarities and contrasts have been noted between the ‘cultures of safety’ in medicine and aviation (Helmreich 2000). Pilots and medical personnel operate in complex environments, interact with technology, and are subject to fatigue, stress, danger, and loss of life and prestige as a consequence of error (Sexton et al 2000). While some may dismiss the similarities, human behaviour under stress cannot be predicted, and is worthy of further investigation and research. The aviation industry, for example, has worked hard to learn from these accidents and one crucial lesson that is reinforced almost every day is, if in doubt, speak up.

If you think you see something out of the ordinary, if you think you see something that does not look right, then say something. You may be missing some information that a senior colleague may have, but it is also possible that you will have a different perspective and you may see something that your more senior colleague has missed. Crucially, it is not about who is right, but what is right.

In the aviation industry, professionals are taught how to speak up, and to listen and respond to any concerns expressed by team members. Airline companies openly support staff who speak up because their priority is ensuring that everyone does the right thing, independent of their rank or role.
Value of non-technical skills

Historically, health care has regarded technical skills and competence as key to patient safety. Technical excellence in nursing and medicine is important because healthcare professionals need to know what they are doing to maintain high standards of care and quality outcomes for patients. However, in contrast to the NHS, other safety-critical industries have learnt that even the most technically qualified and expert individuals can encounter difficulties when under stress. Such non-technical (cognitive and social) skills need to be valued equally (Flin and Maran 2004). Humans, when under pressure, have a capacity to become overly focused or fixated on technical problems (Dirkin 1983). Without appreciation of the ‘bigger picture’, or appraisal of alternative options and intervention, decision making can be poor.

Experienced and expert staff can become blinded to such an extent that their decision making is recognition-based or intuitive, rather than cognitive (Crosskerry 2005). Stress-impaired cognition can mean that individuals reach decisions too slowly, too quickly or inappropriately, and that they may behave in ways that discourage open discussion with their colleagues (Crosskerry 2005). This means that people may fail to make best use of the intelligence, talent and observation of others in identifying solutions to remedy problems.

How individuals are perceived by their colleagues is also an important factor. If colleagues regard an individual as unapproachable or aggressive, it is highly unlikely that team members will feel able to raise concerns when under duress, or when things are going wrong.

Human factors: making care safer

Tens of thousands of patients are treated every day, by teams of dedicated and motivated healthcare professionals. The vast majority receive treatment that alleviates or improves their symptoms through evidence-based interventions and quality care that is personalised, safe, empathic and dignified. Tragically, however, an unacceptable number of patients are harmed as a result of substandard care or treatment, or as a consequence of poor systems and the latent conditions within organisations.

The science of human factors involves understanding what, how and why things go wrong. The Clinical Human Factors Group (www.chfg.org), a UK-based charity, is working to promote understanding and integration of human factors in the NHS because their relevance to patient safety and professional practice is significant, as highlighted in the public inquiry into failings in patient care at Mid Staffordshire NHS Foundation Trust.

The conclusions and recommendations of the inquiry’s chair Robert Francis QC are pending and much anticipated. The closing submission of the counsel to the inquiry presented by Tom Kark QC on December 1 2011 (Kark 2011) highlighted the significance and effect of human factors, namely that too many individuals lost sight of the bigger picture (lack of situational awareness) and that too many had become overly focused on targets.

Nurses, doctors, the board, the regulator, politicians and the Department of Health all had a role to play. At the most senior level, targets were created with good intention, but without full appreciation of their unintended consequences, and effects on staff, the service and ultimately patient care.

The regulator regulated without observing human behaviour. The board allowed itself to be overly focused on targets, without observing or listening adequately or appropriately to staff who had their finger on the pulse at the organisation.

Those at the front line, confused and confused by the pressures of the system, overlooked their individual professional accountability and crucial role as patient advocates to speak up; they acquiesced, retreated and failed to exercise their voice. Human factors science recognises that although much anger is directed at front line staff in instances of patient harm and failure, it is the overall system that drives human behaviour and fails patients, not bad individuals (Reason 1997).

Speaking up

Speaking up in the face of a potential breach of patient safety is everyone’s business, rather than the responsibility of a few. The importance of speaking up should not be limited to a particular environment or context, such as the operating theatre as illustrated in this article, but it applies to any situation in which a patient or colleague is vulnerable or at risk, and where it is obvious that the team lacks situational awareness.

In recent years, considerable emphasis has been placed on whistleblowing, a principle that has its place in the safeguarding of quality care, but one which is often perceived as involving heroic or extraordinary action. Taking account of timescales, it is certainly used as a last resort, when all other avenues have failed. Whistleblowing, however, has by association become a pejorative term, largely as a result...
of case reporting in the national and professional press of circumstances when practitioners have not been heard, but pilloried, or when crucial signals of safety breaches were not responded to appropriately by those in a position of responsibility.

Speaking up is integral to professional accountability and action. Anxiety regarding what to do and when are unfortunately a feature of clinical practice, for there can be few absolute rules. Deciding what to speak up about and when is a matter of individual professional judgement.

Conclusion

In the light of the tragic case of Elaine Bromiley, attention has been paid to nursing action in a peri-operative context. It is important, however, that doing right by patients is recognised as independent of the environment of care or professional group and is at the heart of nursing accountability. Doing right by patients is the responsibility of all nurses. Understanding how human factors affect individual behaviour and that of colleagues could support safer and better health care.

References


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