Life as they see it - members of AfPP write on issues that concern or interest them

KEYWORDS Human error / Human factors / Teamwork / Non-technical skills

Provenance and Peer review: Commissioned by the Editor; Peer reviewed; Accepted for publication 14 April 2009.

Would you speak up if the consultant got it wrong?

...and would you listen if someone said you'd got it wrong?

by Martin Bromiley, boxed article by Lucy Mitchell

Correspondence address: Martin Bromiley, Clinical Human Factors Group, c/o 6 Dudley Close, North Marston, BUCKINGHAM, MK18 3RA

In 2005 my late wife died during an attempted operation. I'm an airline pilot and I recognised early on that the factors that lead to Elaine's death mirrored those commonly found in many aviation accidents.

In this article I'll ask you to reflect on the culture within healthcare around human error and 'teamwork'. I will ask you to reflect on your own personal responsibilities about safety. I will also argue that technical competence is not a guarantee of safe outcomes; alongside it you must have competence in 'non-technical' skills.

I apologise in advance if my article over-simplifies the complexity of both clinical decision making and human factors. I cannot claim any clinical knowledge, and my understanding of human factors is as a practitioner, not an expert. Whilst I still fly part-time, the balance of my time is spent working (in a voluntary capacity) with some very special clinicians, academics and policy makers. These people make up the supporters and 'Standing Group' of the Clinical Human Factors Group who are working to promote better understanding of human factors and good non-technical skills. Please see www.chfg.org for more details.

Human error

At the core of this article is human error. How do you feel about a colleague who makes a mistake? Are they a poor performer, are they 'weak'? Or does it depend on the impact of that mistake? If you miscalculate a drug dose which does no harm is that just 'human error'? But what if a colleague accidentally kills a patient, is that now negligent?

If you look at other safety critical industries, such as the armed forces, the nuclear industry, oil production and my own, aviation, then you will find an acceptance that error is inevitable and to be expected; if you like - it's normal. People will err, so the emphasis is on developing systems that help catch or prevent error. By 'systems' I don't mean complex technical systems (although of course they are used), but procedures and ways of working that help the humans within the system to catch the small errors before they become big errors. And of course fundamental to this is an acceptance by all people at all levels that errors are normal, and not to be hidden by embarrassment or fear of recrimination. In aviation we spend an enormous amount of effort training pilots, engineers, cabin crew and air traffic controllers about human error: how it can happen, how we can support each other to catch it, and of course we learn how we can anticipate it. (Flin et al 2008, CAA 2008)

However, my observation is that in healthcare error is still considered to be due to poor personal performance, errors therefore must be due to a 'bad' person.

Unfortunately the legal system and press often encourage this view: get rid of the bad person and the public will be safe. That of course isn't to say that gross negligence, such as flagrantly disregarding protocol, or deliberate acts should be tolerated. In a 'just culture', mirrored in most UK airlines policies, freely admitted human error is not subject to disciplinary action but the operator retains the right to discipline in the event of gross negligence or deliberate acts. How many of you go to work having decided you're going to make an error? The fear of prosecution simply drives us to hide error so creating a just culture in the NHS is a critical step. What's your own Trust's policy? And what's your own approach to colleagues who make an error?

Teamwork

Before we look at a real story where human error led to a patient's death I also want you to reflect on teamwork. Often people instinctively feel that they're in a good team or bad team – 'if it feels nice to be here then it must be a good team'. Usually experienced NHS staff tell me that the days of good teamwork are gone – 'in the old

The proposed anaesthetic technique was to avoid tracheal intubation and maintain the airway with a laryngeal mask

days you worked with a team you knew, everyone was on the same wavelength, but these days I could work with any number of consultants and half of them I hardly know'.

Taken to it's simplest level teamwork can be defined as 'working together to achieve the same goal'. And I would argue that often it's only when things go wrong that you really understand whether your nice, cosy team is really a team or a collection of individuals. I would also like to challenge the belief that good teamwork only occurs with familiar people. But more of this later.

Elaine's story

I'd like to offer the story of Elaine, my late wife and 'mummy' to our two young children. All the clinical staff, as far as it's possible to know, were well trained and technically competent and had the technical knowledge to cope with the emergency that occurred. Unfortunately at the Inquest they talked about what they should have done, but none could understand why they didn't act in the way they believed they should have done.

Our understanding of what happened is greatly helped because an independent review took place of Elaine's care. This was conducted by Professor Michael Harmer, MD FRCA, the then President of the Association of Anaesthetists of Great Britain and Ireland and recently retired Deputy Chief Medical Officer of Wales. A full anonymous copy of the report and inquest verdict is available at www.chfg.org but the salient points of the attempted operation are as follows (Harmer 2005, Bromiley 2005, Bromiley 2008).

Elaine was booked in for endoscopic sinus surgery and a septoplasty on 29 March 2005. A very thorough pre-op assessment was carried out and there were no significant concerns. The proposed anaesthetic technique was to avoid tracheal intubation and maintain the airway with a laryngeal mask. Elaine was not pre-oxygenated. At the start of the procedure there were two people present. Dr A was a consultant anaesthetist who had 16 years experience and was regarded as 'diligent' and 'careful' by his colleagues. His assistant was a senior ODP.

Zero minute Anaesthesia was induced, but it was not possible to insert the flexible laryngeal mask due to increased tone in the jaw muscles. Another 50 mg of propofol was administered and a second attempt made. Dr A also tried two sizes of laryngeal mask but was unable to insert either.

+2 minutes Elaine looked cyanosed. Her oxygen saturation was 75%.

+4 minutes The oxygen saturation continued to drop to 40% over the next minute or so. Attempts to ventilate the lungs with 100% oxygen using a facemask and oral airway proved extremely difficult.

+6 – 8 minutes It was still proving near impossible to ventilate the lungs and the oxygen saturation remained perilously low (40% which we believe was the monitor's lower limit). Dr A decided to attempt tracheal intubation at this stage to overcome the problems with the airway. He gave 100 mg of suxamethonium (a paralysing drug to allow insertion of the tracheal tube).

At about this time, Dr A was joined by Dr B, another consultant anaesthetist who was in the adjoining theatre. The senior ODP had called for help and during this period an ODP with 6 months in post and two experienced recovery nurses arrived in theatre. Mr E, (the ENT surgeon who had 30 years experience) also entered the room at about this time. To summarise, at this point we have two anaesthetists, the ENT surgeon, two ODPs and 2 nurses present. For the sake of simplicity I shall refer to the ODPs and nurses as the 'theatre staff'.

At the inquest additional information came to light and as a result the time other staff arrived differs from Prof Harmer's report. We discovered that one of the nurses went out to phone the intensive care unit as she was shocked at Elaine's vital signs and colour. On return she announced 'A bed is available in intensive care', but in her own words the consultants looked at her as if to say 'What's wrong? You're over-reacting'. She went back to the phone and cancelled the bed. Meanwhile the senior ODP asked her colleague to fetch the 'trachy' kit. On her return her colleague announced to the consultants that 'The tracheostomy set is available', but felt ignored. (Later, at the inquest, two of the theatre staff present stated that they had known exactly what needed to happen. In Professor Harmer's verbal statement to the Coroner though, he commented that he felt they 'didn't know how to broach the subject').

+10 minutes On insertion of the laryngoscope to allow insertion of the tracheal tube, it was impossible to see any of the laryngeal (voice box) anatomy. Ventilation still proved extremely difficult despite the use of four-handed attempts.

The situation with hindsight was now that termed 'can't intubate, can't ventilate'.

+12 – 15 minutes Further attempts at laryngoscopy and intubation were made using different laryngoscopes but to no avail. Visualisation was attempted with a fibre-optic flexible scope but was not possible due to the presence of blood. O_2 saturation remained at 40%.

+16 – 20 minutes Mr E attempted intubation with a standard anaesthetic laryngoscope. He was able to see the very end of the epiglottis and attempted to pass a bougie into the larynx over which a tracheal tube could be 'railroaded'. He was unsuccessful. Oxygen saturation remained at 40%.

+20 minutes Insertion of an intubating laryngeal mask allowed some ventilation, though it still remained difficult to ventilate the lungs. Oxygen saturation still at 40%.

+25 minutes The insertion of the intubating laryngeal mask improved matters and the oxygen saturation rose to 90%.

+28 – 34 minutes Attempts were made to insert a tracheal tube through the intubating laryngeal mask. Initially, the attempt was undertaken blindly and then using a fibre-optic flexible scope. During these attempts, the oxygen saturation was unstable. At no time did it exceed 90%.

+35 minutes In view of the problems encountered, it was decided to abandon the procedure and allow Elaine to wake up.

Would you speak up if the consultant got it wrong? ...and would you listen if someone said you'd got it wrong?

Continued

At the inquest, the theatre staff recalled a brief discussion among the consultants about performing an 'awake intubation' to which two of the theatre staff said simultaneously 'no', although the consultants claim not to recall this.

Once Dr A was happy that Elaine was breathing satisfactorily with the oral airway in place, she was transferred to the recovery room.

It is clear now that the recovery nurses were far from happy with Elaine's condition. Even nearly one hour after admission, there was no sign of recovery of consciousness and whilst Elaine was breathing, the pattern was erratic. Concerns increased and eventually it was decided that Elaine needed to be transferred to the intensive care unit. This took place at about 11.00.

Elaine died 13 days later having never regained consciousness.

Understanding accidents and human error/factors

Perhaps because aircraft accidents are high profile we have a long history of thorough investigation. In the last 40 years or so this has been aided by an understanding of human factors. Human factors can be hard to define; it's really a 'pseudo' discipline covering many areas such as the design of equipment, human behaviour under normal and stressful conditions, and human error (Dekker 2005). However, in simplistic terms, it's trying to understand why humans don't behave predictably, and therefore finding ways to reduce error.

Let's start looking at Elaine's case from a human factors (HF) perspective. None of the staff involved expected this day to be any different from any other. It was a normal day at work. They were normal people. Everything initially looked normal in Elaine's case. No one planned to make any errors, everyone involved was well qualified, well respected, just like you.

What did they expect, in other words what was their 'mental model' at the start of that day? Did any of the team imagine they may face difficulties? Did any of them think through, either privately or with their colleagues how they might react if certain problems occurred during Elaine's procedure? Doctor A had conducted a thorough and careful pre-op assessment. Arguably there was nothing in Elaine's condition that would have led him to think now about potential problems.

Initially he reacted as many would have expected, in this case by resorting to intubation. However when intubation was difficult, it appears that the problem became one of difficult intubation. In reality of course we know now that the problem perhaps should have been defined as one of ventilation. This is called fixation. When faced with a stressful situation we become focussed on it. In simple terms it allows you to cope with a stressful situation by 'giving your full attention' to it. Perhaps this is why the three consultants didn't react to the nurse's announcement of the 'trachy' kit being available?

How can teamwork help?

In aviation we often say that it's the captain who is responsible but the whole team is held to account in an investigation. Fundamentally in Elaine's case you have a group of three senior and experienced medics who should know what to do. But is that a fair view?

Sitting around a coffee table chatting about 'can't intubate, can't ventilate' it's easy for most clinicians to know how to deal with it. Yet in real life it's perhaps no surprise that a team would persist in attempts to intubate because 'intubation is a reliable solution'. To quote one anaesthetist from a private email: 'We intubate tracheas week in and week out. Even when it's difficult, it's what we do, we are fairly comfortable adjusting, trying different kit until we get that tube in the right hole. I think this push away from thinking surgical airway and pull towards trying to intubate predisposes us to fixation and denial'. Denial isn't a conscious choice we make but is a normal reaction to stress - a protection if you like, while we come to terms with the problem. Again, perhaps the 'under-reaction' to the nurse who phoned ICU was due to this.

Yet the nurses were clearly aware that things were going wrong, but seemed unable to say anything. We are taught respect for our senior and/or experienced colleagues. It's often 'simply not your place' to speak up. Again this deference to others is very common in incidents and accidents the world over. Were the nurses unassertive, unsure perhaps? Did the consultants create an atmosphere which encouraged junior staff to speak up?

We know from studies of near misses in aviation that teamwork requires the whole team to support the building of what we call 'situational awareness' or 'big picture' and the subsequent decision making process. In Elaine's case it would appear that those standing around the outside could see what was happening whilst those closest to the problem were fixating on one thing. This requires two 'solutions': an ability to speak up clearly and unequivocally (i.e. assertively); and an ability to listen and accept help.

It's often at this stage that nursing/ODP staff will say 'but this was how it worked in the old days, now I don't know my medics well enough to do this and they don't know me'. In civil aviation we don't normally plan to work with the same colleagues each day. In my airline we have approximately 450 pilots and 3,000 cabin crew. Each day we fly with a another pilot and somewhere between three and nine cabin crew so it's normal that even after a long career you won't have worked with many of them! In this situation how do you create teamwork?

You do it by three methods. The first is a very clear focus throughout all training and assessment on what our common goal is – which of course is safety at the highest possible level. We don't hide the word and talk about quality. We talk about safety every day, it's fundamental in the pre-flight briefings and on an on-going basis in all decision making.

Secondly we work within Standard Operating Procedures or SOPs. These dictate what we do, in what order, what we check, what checklists are used etc. That way I might fly with a range of colleagues but I have a good anticipation of how they

Help each other, speak up, be sensitive to egos, choose words carefully first time round; but make sure you are direct and to the point second time. The third time it may be too late

are likely to work, expect and react. (Some medic colleagues talk about restricting freedom to use their professional skills etc, but we know in aviation that the weaker the compliance with SOPs the higher the accident rate. Whatever advantage you gain from freedom to work 'your way' it's rarely greater than the disadvantage it creates for colleagues in lack of predictability).

Finally, great store is placed in developing not just our technical skills but also our non-technical skills. As an example - I am assessed 3 times per year. Each assessment has eight categories: four technical (such as handling the aircraft and knowledge of technical procedures) and four non technical – leadership, decision making, situational awareness and cooperation. Note that communication isn't one of them as it is a critical component in all. Yes non-technical skills are so important to safety that they comprise 50% of my assessment! (CAA 2008).

Psychologists at the University of Aberdeen have worked with clinicians to identify taxonomies of non-technical skills, similar to those taught to airline pilots. They have developed rating systems to assess these skills for anaesthetists (ANTS) and surgeons (NOTSS). Lucy Mitchell is developing a similar rating system for scrub nurses' non-technical skills (funded by NHS Education Scotland) based on interviews and observations of experienced theatre nurses.

Non-technical skills required for safe and effective scrub nurse (SN) performance include teamwork, situation awareness and task management. Cognitive skills are crucial: the SN is thinking ahead and absorbs cues in the theatre environment. The SN gleans information by listening to conversations between the surgeon and other staff. By attending to the operating procedure and recognising signs e.g. excessive bleeding, the SN can provide instruments in a timely fashion to contribute to the smooth flow of the procedure. Noticing changes in the surgeon's body language can also provide critical clues for the SN.

Teamwork skills include speaking up when a problem is noticed or patient safety is being threatened.

Work is continuing to refine the set of scrub nurses' non-technical skills and to develop examples of behaviours to guide an observer rating a nurse's performance. Nurses' NOTECHS tool will provide a method for nurses to objectively rate the behaviours displayed by those they are rating, to enable positive feedback, constructive criticism and a structured means for ongoing training to encourage safe and effective performance. Details of the nurses' NOTECHS can be found at: www.abdn.ac.uk/iprc/nursesnotechs

Conclusion

I hope I've given you a small flavour of a different way of looking at error and how in one industry we manage human factors. We are still learning, and occasionally re-learning old lessons in flying so I don't wish you to be left with the impression that we've got it all right. That's part of my challenge as an airline pilot.

In October 2008 I presented Elaine's story at the AfPP conference in Harrogate. At the end there was a line of people wanting to speak to me. One of them looked vaguely familiar. She introduced herself – it was the senior ODP from Elaine's attempted operation. I was both delighted and deeply touched that she'd attended knowing that I was to speak. Please take time to think about how she might feel and what she's had to deal with. How would you feel? She and her colleagues are not bad people, they are not poor clinicians. They were good people doing a good job who had the technical skills to deal with what happened. But by behaving as normal humans do, and not having the benefit of training in non-technical skills found themselves following a blind alley.

The key is not to eliminate error but to maintain a culture which increases the probability of small errors being caught before they become errors that harm. The consultant is not 'God' but is someone who, despite great insight, is a normal human and prone to all the errors that normal people make. The same of course applies to you.

Help each other, speak up, be sensitive to egos, choose words carefully first time round; but make sure you are direct and to the point second time. The third time it may be too late.

And if you are the person being spoken to, listen and answer what's raised: the person who is speaking may be trying to help save you from becoming a victim.

As we say in aviation, it's not who's right but what's right that counts.

References

Bromiley M 2005 **Verbal evidence from the Coroner** www.chfg.org

Bromiley M 2008 **Have you ever made a mistake?** Bulletin Royal College of Anaesthetists Bulletin 48 2442-2445

Civil Aviation Authority 2008 **CAP737** CAA

Dekker S 2005 **Ten Questions About Human Error** Lawrence Erlbaum Assoc

Flin R, O'Connor P, Crichton M 2008 **Safety at the Sharp End: A Guide to Non-Technical Skills** Aldershot, Ashgate

Harmer M **Report into the death of Elaine Bromiley** 2005 www.chfg.org

Mitchell L 2008 **The non-technical skills of theatre nurses** Journal for Perioperative Practice 18 9 378 – 379

About the authors

Martin Bromiley
Airline Transport Pilots Licence (A)

Current Airline Pilot and Chair of the Clinical Human Factors Group

Lucy Mitchell
MA(Hons), MRes (Psychology)

Psychology Research Assistant, Dept of Psychology, University of Aberdeen

Disclaimer

The views expressed in articles published by the Association for Perioperative Practice are those of the writers and do not necessarily reflect the policy, opinions or beliefs of AfPP.

Manuscripts submitted to the editor for consideration must be the original work of the author(s).

Email: hq@afpp.org.uk
Telephone: 01423 508079
Fax: 01423 531613

Association for Perioperative Practice
Daisy Ayris House
6 Grove Park Court
Harrogate HG1 4DP
United Kingdom