Aviation: a pilot study for safety in gastroenterology?

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In 1999, a Korean Airline aeroplane took off from Stansted, UK. The Captain's artificial horizon failed, which therefore gave inaccurate readings; the first officer had a correctly functioning horizon and the flight engineer had a clear view of both. Neither flight engineer nor first officer felt able to point out the captain's instruments failing, with the clear cultural training of 'I must not question the captain'. The result was the aeroplane was flown into the ground by the commander and all the crew died. The outcome of this disaster was ultimately that worldwide pilots came to be taught enhanced mandatory safety standards.

Aviation has many similarities to medicine in that both involve professional teams responsible for complex decision making, using specialised technology, within a high-risk environment. Both have in place accepted practices to minimise potentially life threatening situations. Currently, there is approximately one passenger death per 10 million flights, whereas in hospitals there is one iatrogenic death per 100–300 admissions. Aviation recognises that three out of four accidents result from a less than optimal human performance;¹ therefore, any improvement here has a significant impact. Human factors are seen as important for improving safety and efficiency. Human error recognises that no person, pilot, engineer or manager can perform perfectly at all times; however, it is the ability to respond to the unexpected that often reveals the safety issues.

Safety remains the first priority for pilots; if a pilot makes a mistake, his own life is endangered as much as their passengers. There have been several successful initiatives that have already been adopted within the medical profession, particularly from a surgical/anaesthetic perspective, as there are clear parallels with an

operating theatre: standard operating procedures were first used in aviation and advanced trauma and life support courses were developed by a pilot.

The emphasis of the safety culture within aviation has been towards promoting group or team responsibility rather than to individuals. There are several initiatives that underpin the current safety culture that may be of benefit in gastroenterology:

- crew resource management (CRM)
- the no blame culture
- Confidential Human Factors Incident Reporting Programme
- training as a responsibility of the airline management
- minimum safety requirements.

Crew resource management

In 1979, the US National Aeronautics and Space Administration undertook an investigation into the causes of air crashes and found pilot/human error to be the commonest cause.² They isolated three areas of concern: poor interpersonal communication, decision making and leadership. Cockpit resource management was the term they adopted to attempt to address these issues on the flight deck, and since then this has been adopted across the flying world, and in other professions such as fire-fighting. The medical profession could also benefit.

The first CRM courses in 1981 in the USA were organised by psychologists and made use of games aimed at increasing assertiveness of junior pilots and reducing authoritarian behaviour of captains.³ Initially, they were greeted with scepticism. The courses then became group exercises, aimed at improving crew communications and tackling the chain of small events which culminate in an air disaster. Cockpit resource management became CRM.

Data suggest that crew behaviour has altered in the time the CRM has been used;⁴ however, it needs to be reinforced regularly and supported by the management.

CRM has been used in branches of medicine such as anaesthesia worldwide and shown to reduce surgical mortality.⁵ There are obvious parallels in medical gastroenterology as a specialty at the interface of surgery, pathology and radiology in which the participants of the team need to optimise autonomous and multidisciplinary working.

The no blame culture or incentivised no fault reporting

The current emphasis in aviation safety is on error management, with the premise that human error is unavoidable. The aim is to try to break the chain of minor errors that can accumulate and create a major error. This has developed into the 'no blame culture', where the reporting of safety concerns can be safely encouraged.

Since the 1990s, if European pilots report to their airline designated safety officer an unsafe situation within 10 days they are incentivised by anonymity and immunity operated by the European Aviation Safety Agency, and lessons are then made public. If the Civil Aviation Authority takes action against any pilots subsequently as a result of the incident, provided no criminal offence occurred, the pilots do not get penalised as they have presented a 'constructive safety attitude'. If an adverse event is not reported but subsequently revealed, there are severe repercussions.

Within the National Health Service clinical governance has become a key medical safety feature, with a focus on risk management. Part of this is a blame-free reporting culture and critical incident reporting for adverse events. This reporting system discourages the cover-up of mistakes, but is neither anonymous nor gives immunity, and can be used in a threatening manner. This could be improved if the system could be divorced from management and made confidential in line with aviation.⁶

Confidential Human Factors Incident Reporting Programme

This programme is an independently run organisation in the UK where all members of crew, maintenance and any division of aviation can report incidents of concern relating to any sphere of airport safety, in the air or ground. This has already been used in surgery as the Confidential Reporting Programme in Surgery. If used throughout a hospital setting it could translate to better conditions for juniors, seniors and patients alike, and more specifically could raise safety standards within an endoscopy department.

Training standards

Airline training is prescriptive and rigorous. Airlines are responsible for the safety training of their pilots; the Civil Aviation Authority must approve all training

and a pilot cannot fly if the mandatory courses are not up to date.

Education and training is one of the 'seven pillars' of clinical governance in medicine, highlighting the use of regular assessment to ensure training is appropriate. The responsibility for arranged training lies with a physician, and training is therefore constrained by availability of courses and physicians' time as well as financial constraints. If mandatory training courses were, for example, an Strategic Health Authority responsibility, they are likely to be taken more rigorously by all parties and therefore will address the safety issues for which they were intended.

When a pilot learns to fly new aircraft systems, analogous to commencing specialist training, training takes on a rigorous set of standards. First, there is e-learning of the new aircraft type, followed by simulator training. Then, there is line training on an aircraft with a dedicated captain. The trainee is examined at each stage and only if successful can progress be made. If endoscopy training followed this format, then JAG could introduce a mandatory period of e-training with an exam, followed by a course using simulators. Only once this was passed could training start on an endoscopy list. JAG accreditation would then provide a final check before solo lists can be undertaken. This could enhance patient safety and confidence in the experience of training.

From close involvement with the airline industry, I have been struck by the many similarities between flight safety and safe medicine. Both suffer from the potential conflict of financial constraint and the provision of quality service. The aviation profession have possibly preceded medicine in their open and constructive attitude to safety. This is something which could be developed further within gastroenterology.

Competing interests None.

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References

1. **Flight Crew Training:** Cockpit Resource Management (CRM) and Line-Oriented Flight Training (LOFT), CAA CAP 720, 20002.
2. Cooper GE, White, MD, Lauber JK. Resource management on the flightdeck: Proceedings of a NASA/Industry Workshop (NASA CP-2120), NASA-Ames Research Center, 1980, Moffett Field, California, USA.
3. Helmreich RL, Merritt AC, Wilhelm JA. The evolution of Crew Resource Management training in commercial aviation. *Int J Aviat Psychol* 1999;9:19–32.
4. Helmreich RL, Wilhelm JA, Gregorich SE, *et al.* Preliminary results from the evaluation of cockpit resource management training: performance ratings of flightcrews. *Aviat Space Environ Med* 1990;61:576–9.
5. Neily J, Mills PD, Young-Xu Y, *et al.* Association between implementation of a medical team training program and surgical mortality. *JAMA* 2010;304:1693–700.
6. Nicholson AN, Tait PC. Confidential reporting: from aviation to clinical medicine. *Clin Med* 2002;2:234–6.