Improving patient safety in the operating room: lessons from the aviation industry

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The need to reduce the frequency and impact of medical errors has generated much discussion. As part of this debate, we have asked how other industries have produced documented safety improvements. US domestic air carriers stand out as an industry that decreased the rate of fatal accidents by almost two-thirds from 1987 to 2006 through purposeful intervention and training.

In the operating room, we have adapted simple methods from aviation to improve safety. For example, the time-out before surgical incision directs the entire operating room 'crew' to simultaneously focus on the correct surgical incision and procedure, and review patient medications and medical allergies to minimize the likelihood of a mistake. This, and similar efforts, are addressing the 'low-hanging fruit' of medical errors. Future improvements in patient safety will require a better understanding of surgical outcomes and consideration of the role of recurrent and requalification training for surgeons. I liken our current situation to where the air carriers were in 1987. Flying was pretty safe then, but we now know that it can be much safer.

At present, we do not adequately understand adverse, but noncatastrophic, patient care events. Such was also once the case in aviation. In 1975, the Federal Aviation Administration (FAA) developed the Aviation Safety Reporting System (ASRS) to gather data about deviations from normal aircraft operations. Pilots, air-traffic controllers, dispatchers, mechanics, cabin and ground crew all participate in the system. Data from the ASRS allow the FAA to understand the frequency and causes of noncatastrophic events that, in other instances, might be part of the chain of failure leading to a major accident. In medical terms, the accident numerator is obvious; the ASRS, however, allows the FAA to know the denominator.

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As an example, runway incursion occurs when an aircraft enters a runway on a controlled airfield without clearance from air-traffic control. This event can lead to a crash, but does not in most instances. How does the FAA entice pilots to report such events? Flying is a highly regulated activity; almost all deviations from normal flight procedures involve violation of a Federal Aviation Regulation, which has the force of law. Entering details of the deviation into the ASRS database confers immunity from FAA enforcement action, as long as there was no accident or criminal intent. Pilots and other personnel, therefore, have a strong incentive to report deviations, thereby providing the FAA with data on the frequency and causes of runway incursions and accidents. This is very powerful information with which to effect change.

Now, consider a urologic situation: patients with urinary retention who require anti-coagulation therapy. Most urologists perform transurethral resection of the prostate (TURP) in these patients, using heparin and restarting warfarin in the postoperative period. We suspect that this is a high-risk procedure compared with TURP in a patient who does not require anticoagulation therapy. We do not know, however, the number of patients treated in this way, and how many of them experience adverse events. Perhaps these patients would be better treated with office-based thermotherapy, even if multiple treatments were necessary. We do not know the answer to this question; we might never know the answers to such questions unless a comprehensive reporting system of patient outcomes is developed. A system that strongly incentivized surgeons to report adverse outcomes to a central database would provide invaluable information for accurately assessing the safety of our interventions.

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Competing interests

The author declared no competing interests.

www.nature.com/clinicalpractice
doi:10.1038/ncpuro1134