Should we be re-evaluated for our skills at a certain age? Or following prolonged time out of the operating theatre? Lessons to learn from aviation medicine

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As the mother of a commercial pilot, I am fascinated by the strict rules and regulations in flight medicine and wonder what the surgical fraternity can learn from aviation protocols. Pilots undergo lifelong training. Even drone pilots must comply with the strict guidelines to prove continuous medical and skills competency, according to the South African Civil Aviation Authority (SACAA).[1] Orthopaedic surgeons qualify after comprehensive training and are then allowed to treat a community unsupervised, to the best of their ability. There is no set review to ensure you are still qualified to perform surgery at an advanced age or after a period of prolonged illness or disease.

What do surgeons and pilots have in common?

Flying an aeroplane and performing surgery combine numerous gross and fine motor skills over a limited period, requiring a high degree of precision, dexterity, decision-making, and cognitive tasks. Commercial pilots are responsible for the safety of their passengers at all times, as surgeons are responsible for their patients. Within the context of the typical workplace, there is minimal room for error and a great deal of responsibility.

Regulations in the aviation world

When an individual embarks on a career as a pilot, they write a series of examinations with a pass rate of 75%, and undergo continuous assessments and grading for each new aircraft they fly, simulator training, regular medical evaluations and flight-specific instrument ratings. These medical tests include, but are not limited to, baseline bloods, visual accuracy, ECG and physical examination. Non-technical competencies, including decision-making, situational awareness, stress management and fatigue coping, are widely taught in pilot training.

The SACAA has an extensive list of strict protocols on return-to-work policy.[1] After disabling illness or injury, during which time a pilot is unable to fly, the pilot is subject to comprehensive evaluation by a group of experts on the specifics of the disease.

Procedural and cognitive surgical skill deterioration after prolonged time of non-operating

Expert surgical skills evolve exponentially up to a particular stage in your career, whereafter they plateau or even deteriorate in non-use. Three main limitations affect the precise cognitive execution of tasks: either we retrieve a step but fail to remember to perform it because of distraction or fatigue, or we retrieve a step but perform it incorrectly, or we forget to retrieve one of the steps in a sequence of steps for a procedure.

After spending some time outside the operating room during the epidemic, I felt like I had ten thumbs when I returned to work. Studies on surgical skill loss have found that skill decay is minimal after two weeks but becomes more substantial after > 90 days.[2] Evidence indicates that during a period of non-operation, cognitive abilities such as recognising facts and concepts, recall of a procedure, and procedural expertise also decline.[3,4] The magnitude of task decay is influenced by factors such as the difficulty of the task, level of expertise, gross motor skills, individual ability and advanced age.

Possible solutions to surgical skill deterioration

Mental training

Cognitive training analysis (CTA) implies teaching through thought strategies, establishing processes and intuition. CTA improves procedure understanding, operation flow and task readiness.[5] The SACAA requires pilots to undergo extensive training to handle various routine situations and emergencies. This training encompasses communication, flight specifics, instrument proficiency, emergency procedures, and adherence to standard operating practices utilising CTA.[6] CTA is also successfully used in surgical training. A recent hip arthroplasty study showed that CTA reduced surgery time and acetabular component malpositioning.[7] Experienced surgeons can successfully utilise CTA to visualise complex surgery in the event of non-operating.[5]

Virtual reality (VR) and simulator-based medical education (SBME) methods

Both methods of training are incorporated routinely in training for pilots and crew members, with clear safety and financial benefit.[3] In the cost-driven health industry, we should utilise these training tools more often. Various studies have proved VR and SBME to be effective in surgery, especially in major joint arthroscopy, where trainees have limited elective surgery training and are taught to perform procedures in a cadaver lab.[2,8]

Peer review and mentoring programmes

Peer review is a swear word from the funder's perspective, but we should use peer review and mentoring to our advantage. We are the custodians of our profession and the public's view of our profession. As such, we should be more open to evaluation by

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our peers. Doctors are the worst patients. When off sick, we treat ourselves and return to work sooner than advised. We believe our skill level is on par, but we evaluate ourselves just as we treat ourselves. Our decisions or surgical performance might become substandard without our ability to recognise our shortcomings. Perhaps it is time to ask a colleague to 'evaluate' your abilities when you return to the theatre after a prolonged time off or at a certain age. As pilots have senior mentors and instructors who evaluate and revalidate their flight proficiency,[6] this revalidation is in the best interest of the public we both serve.

Refresher training

There are numerous opportunities to upskill our knowledge and techniques. When needed, have the courage to enrol and retrain to a surgical standard that is acceptable.

Professionalism is the community responsibility

The SAOA has recently raised the age for becoming emeritus members from 65 to 70 years, acknowledging that surgeons are extending their careers beyond previous norms. However, there are no clear guidelines to determine that you maintain the same level of precision and professionalism as before. Your abilities are not being revalidated or benchmarked.

We, as a society, are responsible for the public we serve. Geoffrey Davies, in the Presidential Lecture delivered at the Annual Scientific Conference of the Australian Orthopaedic Association in 2010, stated that professionalism among surgeons is a collective responsibility.[9] We provide surgery in the best interest of the patients. But when eyesight, coordination or tremor is deteriorating, to the detriment of the patient, who will protect you and the public you serve? Some healthcare professionals have these 'jumping castle' practices where they pull the plug after years of practising, and everything collapses. There is no continuation plan or someone to take care of their patients. Let's hope we all have a colleague who will confidently tell you that it is time to stop operating before you are forced to. Let's hope you have a succession plan in place for your practice's patients, including a mentee who can continue their care. That's what community is about. Perhaps we should routinely review our skills, like pilots do. Let's go for an eye exam or be open about your decision-making abilities and neurological decline.

There are no guidelines to ensure that you fulfil your collective public commitment or carry out your surgical duties individually to a suitable professional quality. Aviation and healthcare have plenty in common (including grandiose personalities). We are always responsible for the public's safety while on duty, and we are the custodians of our profession. We have much to learn from the aviation protocols. Let us maintain professionalism by periodically and informally re-evaluating our skills to uphold the highest standards.

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