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The 'human factor'... Worth considering?

On any given day, be it in our professional or personal lives, our predominant thought processes are geared towards outcomes. How often, though, do we allow ourselves time to pause and reflect on the human factors involved in our decision making?

Up until around thirty years ago, the world of aviation was heavily focused on outcomes, with the emphasis of flight training being on actual physical flying skills and external factors such as the assessment of weather on the flight. It wasn't until the world experienced a series of major aircraft accidents that 'human factors', or more specifically crew resource management, came to prominence in the training of pilots. This training examines how we, as humans, act and react when exposed to a variety of challenges in our lives. Challenges such as fatigue, distraction and team dynamics.

Human factors training looks at how our decision making is affected under these pressures, including our ability to lead teams, communicate with each other and work towards achieving a common goal. Is there anything we can learn from this journey in aviation that can be applied to the surgical environment?

When we examine both the modern aircraft flight deck and the operating theatre, certain similarities stand out:

- both groups consist of highly skilled professionals who are actively driven to provide the safest outcomes for those in their care
- both groups rely heavily on rapidly advancing technologies
- both groups have a well-defined team structure
 - + the flight deck is made up of the captain, first officer, and second officer(s)

- + the operating theatre has the specialist surgeon(s), assistant surgeons, anaesthetic staff, nursing staff and various technical staff (in no particular order)

- both groups consist of human beings who are vulnerable to fatigue, distraction and illness. Illness may be only subtle, but could still have an impact on performance.

Prior to human factors training, communication among flight crew members was often stifled by rank. The captain of the aircraft was the most experienced pilot and their decisions and actions were rarely questioned. The environment that modern aircraft commanders endeavour to establish is one that encourages an open and honest flow of information among the team members, especially in the case where a team member is expressing concern or bringing to the attention of others in the team potential threats to the safe continuance of proceedings.

In aviation, the flow of information among crew members is often referred to as the 'authority gradient'. The term 'gradient' implies the ease with which input can flow within the team structure – too steep a gradient from the top down, for whatever reason, potentially restricts the ability for information to flow from the bottom up.

There have been plenty of examples in the aviation world where accidents have occurred and concerns had

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not been raised by the other crew members.

Most airlines now have a mandated procedure or checklist to give junior crew members a framework to express concerns regarding the continued safety of the flight. Senior crew must provide an environment where other members feel comfortable sharing input.

For an authority gradient to be effective, it should be 'shallow' enough to provide such an environment, but not so shallow that everyone in the team feels that they can overrun the team leader with 'helpful' suggestions. At the end of the day, the final responsibility rests with the captain or surgeon.

Before our day at work begins, we may iron a shirt and pack our lunch. We are not, however, in the habit of taking time to assess our mental state before our workday starts. Over the last few years I've developed a routine that incorporates exactly this – pilots love checklists and routines! As I drive from home for a flight, I firstly go from head to toe on my uniform, making sure I have my hat, tie, epaulets, wings, jacket etc., then all required documentation like passport, ID and wallet. Finally, I finish with a quick check for any domestic distractions and reaffirm that I'm actually capable of operating at my best. Events such as new babies, relationship issues, financial worries and many other things in our ordinary lives can unwittingly take up valuable brain space and prevent us working at our full potential.

It's not automatic to assess ourselves before every duty. It's much easier to let the 'autopilot' get us ready and then transport us to our workplace without much conscious thought. My routine, or checklist, stops my autopilot taking over. My passengers deserve me at my best, so do my crew, and so do I.

The autopilot is actually a great analogy. On the modern flight deck, with flight times pushing 18 hours, we rely heavily on automated systems to do some of the 'heavy lifting' or help with the actual flying of the aircraft. This allows us to manage our workload to accurately assess other things, such as the aircraft systems, weather en route, fuel status, and perform other tasks. The autopilot is an extremely valuable tool, but it does have its limitations. At present, it is not capable of diverting around bad weather or turbulence – this requires manual pilot intervention. Being a computer-based system, it is only as good, in terms of navigation and performance, as the data you program into it.

Overreliance on the autopilot can lead to complacency and a situation where it would be possible to 'tune out' and lose focus on the flight's progress. Similarly, we humans tend to use our own version of an autopilot. We sometimes let the autopilot attend to our daily tasks, such as work schedules, theatre lists and other duties, rather mechanically. Our 'personal autopilot' can take us into some rough weather if we tune out to what is happening around us.

Communication is the linchpin in every team endeavour. Effective communication allows for the timely and relevant flow of information within a team. It empowers teams to report safety related concerns without fear of recrimination. Effective communication is crucial in the maintenance of the 'shared

mental model' where each team member is clear about the overall situation, plan and desired outcome.

Communication is often the first thing that is compromised when we are fatigued, distracted, unwell or overwhelmed. Highly effective teams maximise their potential by having an authority gradient which allows timely and relevant communication among the members and a structure that regularly monitors the ongoing fitness and performance of individuals. This structure can minimise the overreliance on our 'autopilot', especially during long shifts and arduous hours of work.

For some time now, the medical/surgical world has adopted aviation-style practices such as simulation training and the use of checklists like the WHO Surgical Safety Checklist. While this checklist was originally introduced to minimise wrong patient and wrong operative site errors, its application has expanded in many places to include the pre-incision 'time out' and now covers many of the human factors aspects mentioned above.

Led by the senior surgical team member, the time out procedure greatly enhances overall patient safety by clearly outlining the plan ahead, including a plan B if required; verbalising team roles and expectations, and identifying critical aspects of the operation. Finally, it allows for input from the team regarding any safety-related concerns they may have. Ideally it is at this moment that each team member checks in to see how they are feeling with particular regard to fatigue, distraction or anything else that may affect performance.

It is my great hope that medicine and aviation can continue to share knowledge to refine procedures such as these, producing safer outcomes for our patients and passengers.

Now that we've taken the time to examine some of our human vulnerabilities and challenges, how is this information relevant in your particular workplace? I encourage you to examine your own professional environment and look at things such as the effectiveness of your 'time out' procedure. Does it consistently outline the objective, primary plan and any possible alternate strategies? Does it define expectations and roles of all team members when required? Is it used as an opportunity for team members to 'check in' on their own physical condition in terms of fatigue, distraction or anything else that might have an adverse effect on performance? Do team members feel comfortable expressing safety concerns? Finally, how steep is your 'authority gradient'? What would you consider an optimum gradient in your professional situation?

The 'human factor'... worth considering? If you are engaged in any activity where your actions directly impact the safety of those in your care, and your role is to produce the best outcomes for those patients, passengers, or clients, then the answer is... absolutely.

Geoff Hay is an Airline Training Captain and author of Ladies and Gentlemen, this is your Surgeon speaking': Exploring the Human Factor in Aviation and Surgery. Geoff was formerly a registered nurse with experience in perioperative nursing before he began his career as a commercial pilot. You can read more about Geoff at his website www.supersonicperformance.com.au.