



Safe anesthesia: learning from aviation

Anestesia segura: aprendiendo de la aviación

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Safety advances in aviation have been incorporated into multiple professions, including engineering, architecture, and medicine.

The field of anesthesia has inherited concepts such as human factors, risk assessment, decision-making, resource management, situational awareness, briefing, debriefing, and systematic use of checklists for improving patient care processes.

Adequate flight planning is critical to ensure accomplishment of objectives.¹ It requires the use of resources such as briefing and debriefing, where the crew meets at the start and completion of each flight, and also at the end of the workday in order to discuss the details of tasks at hand, distribute duties, review emergency procedures, among other things.

In addition, adequate use of checklists is critical, including the implementation of the comprehensive PAVE checklist (P for pilot, A for airplane, V for environment, and E for external pressures). Each letter represents an entire checklist. "P" uses the "I'm SAFE" checklist to assess the physical conditions of the pilots for flying. Each letter is a question and asks the pilot about diseases, use of sedatives or stimulants, use of alcohol in the past 24 hours, stress, adequate rest, and food intake. "V" analyzes official meteorological and aeronautical sources. "E" checks for external pressures that may have a negative

impact on the flight. Finally, "A" is the checklist for every aircraft and includes items ranging from cabin preparation through to engine check, external 360° aircraft assessment, engine ignition, taxiing, take-off, leveling, descent, approach, landing, final taxiing, engine shutdown, and final considerations.^{2,3}

Like in aviation, checks are required before giving anesthesia. The "Safe Surgery Saves Lives" campaign, a WHO initiative under the World Alliance for Patient Safety, was launched in 2008 with the aim of reducing adverse events, including death, among patients taken to surgery. It consists of the use of the surgical safety checklist with the aim of lowering the probability of forgetting key steps during the intervention. It requires a review of activities at 3 critical points in time: before the administration of anesthesia, before skin incision, and before the patient leaves the operating theater. Moreover, they are part of the "Five Safety Steps" complemented with briefing and debriefing.⁴

It has been shown that the majority of adverse events that occur in surgery units are due to the lack of nontechnical skills among health care personnel, including communication, coordination, leadership, and decision-making skills. Hence, the importance of training anesthesia residents and students in these human factors.

Checklists have been recently implemented for the management of critical events during surgery.⁵ However,

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it is of the utmost importance for the staff to become familiar with their daily use during normal procedures and not just wait to apply them during emergencies.

In fact, it is highly probable that the anesthetist who never uses checklists on a regular basis may actually use them appropriately during an emergency. In health, it has been shown that the use of checklists has a positive impact on adverse events and mortality.^{4,6,7}

The systematic use of checklists prevents staff from overlooking steps or omitting details. It also removes 1 of the 11 links shown to be implicated in the origin of aircraft accidents: vacuum sensation.

Checklists may be used individually in 2 ways: "reading and doing" or "doing and reviewing at the end." The first approach is recommended in particular for people who have never used checklists and in processes requiring many steps, such as checking the machine and the operating room. The second approach is recommended for use by experienced staff or in processes requiring just a few steps, such as anesthesia induction. They may also be used in a group approach, with support from fellow workers who can help with their implementation. Consistent implementation during a surgical procedure will help the staff maintain high situational awareness, minimizing potential errors.

Errors are inherent to human nature,⁸ especially when individuals are faced with complex tasks. Hence the need for continuing training for increasing nontechnical skills, which require enhanced communication among team members and work toward clear objectives within a maximum safety margin.

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