



Learning From Others:

Anesthesia
Quality Institute 
ANESTHESIA INCIDENT
REPORTING SYSTEM (AIRS)

A Case Report From the Anesthesia Incident Reporting System

Review of unusual patient care experiences is a cornerstone of medical education. Each month, the AQI-AIRS Steering Committee abstracts a patient history submitted to the Anesthesia Incident Reporting System (AIRS) and authors a discussion of the safety and human factors challenges involved. Real-life case histories often include multiple clinical decisions, only some of which can be discussed in the space available. Absence of commentary should not be construed as agreement with the clinical decisions described. Feedback regarding this article can be sent by email to r.dutton@asahq.org. Report incidents or download the AIRS mobile app at www.aqiirs.org.

Case 2015-9: The July Effect: What Really Causes the “Killing Season”?

Forgot surgical pause prior to starting surgery on elective case. Omission realized 10 min after case start, at which time time-out was performed. Every regular staff provider had a student-learner: EM resident with anesthesia, nursing student with circulator, medical student with resident scrubbed in and surgical resident had not done this procedure before. Lots of distractions due to missing equipment.

Discussion

It's that time of year again – health care centers across the country experience a massive cohort turnover as newly graduated medical students become resident physicians, and new responsibilities and autonomy are given to existing trainees. The public has long been advised to avoid seeking medical care in July because of a presumed increase in risk. This changeover is called the “July Effect” in the United States and the “August killing season” in the United Kingdom. Indeed, a review of 39 studies by Young and colleagues confirms that mortality is increased and efficiency is decreased around the time of these trainee changeovers, although a firm conclusion about causality (including whether more medical errors were made) was not established.¹

This case discussion focuses on the potentially deleterious effects on patients from cohort turnover and the contributing factors beyond the obvious one that new physicians have less experience than seasoned doctors or more senior trainees. Although the information provided in the case report is not detailed and there was no apparent harm to the patient, we see several themes worth mentioning: a mandatory safety process was forgotten, multiple trainees were present, the procedure was novel to the surgeon and necessary equipment was not immediately available.

Are trainees in and of themselves patient safety threats? If so, why? The first and most obvious problem is that inexperienced physicians (and other health care team members) make more mistakes. This is not unexpected, however, and there

are supervisory practices in place to prevent simple inexperience or knowledge deficits from harming patients. Therefore, we'll focus on other factors that may reduce the effectiveness of such safety systems.

A large category of behavior that may be susceptible to an uptick in errors during cohort turnover is communication. Communication failures include things that are said but are in error (active failures) and things that are not said and should have been (passive failures). Lingard² classifies active failures as communication of wrong information, the right thing said to the wrong person, the right thing said at the wrong time, and failure to link communication to action. New physicians in a new environment would be more likely to make each of these errors due to lack of familiarity with the knowledge base of a workplace and its culture.

Stiegler and Tung address passive failures, which they suggest are rooted in *omission bias*: the tendency to preserve the status quo rather than speak up or take action.³ Team members in all disciplines (and at all levels) sometimes fail to “speak up” or ask questions for fear of looking ignorant or jeopardizing a relationship.⁴ How much more likely would this type of omission be among new trainees who are just establishing clinical reputations and professional relationships that will linger with them for the duration of their training? As well, new teams with unfamiliar members who are just learning to work together lack the mutual trust that fosters uninhibited communication, especially around uncertainty or disagreement. Moreover, medical culture has deeply rooted hierarchical organization that historically discourages challenges or questions to authority figures. Although this is fortunately changing, it is still a possible contributor to omission bias.

Another possible cause of the July effect is related to teaching and supervision itself. Because teaching and supervising require different cognitive processes than direct task performance, and because some of those processes may be new to senior trainees or new attending physicians, the cognitive load on the supervisor is increased. That is, he or she must not only think about the

tasks and data at hand but must also think about the trainee's actions and decisions and must expend mental effort to critique, demonstrate or direct. Because humans can only give attention to a finite number of things at the same time, it makes sense that either some element of teaching will suffer or some element of patient care will be overlooked, especially in circumstances of time pressure, high-stakes decisions and rapidly evolving clinical conditions. In the case presented, this influence was elevated because all usual team members had trainees, so the potential for performance cross-checking (e.g., an experienced nurse catching a trainee physician's misstep) is diminished. Performance cross-checking is a critical element of crisis resource management⁵ and for management of clinical cases even in the absence of a crisis.

"Social shirking" is a factor to be considered as well. This term denotes the phenomenon by which neither party in a "double-check" actually performs their independent verification, assuming the other party has done so. This may be intertwined with hierarchical team dynamics: if a junior trainee assumes that a senior or attending is also checking, they may be more likely to defer. An example in anesthesiology could include the multiple actions that occur around the time of intubation (confirming endotracheal tube position, ensuring adequate air in the cuff, turning on volatile anesthetic, securing the tube, setting and activating the ventilator, etc.). Because assistants often help with one or more of these tasks, any one of them could be delayed or missed if assumed by one party that the other has done it. This could also present when one member of the team has information others do not have, such as a lab value that would alter intended plans, but assumes others have checked and defers to their decisions (not realizing that the other person is not similarly informed). Teamwork is clearly important but presents a challenge when explicit responsibilities are not clear.

From a systems perspective, cohort turnovers result in a loss of tacit knowledge held by the departing cohort. This is distinct from clinical inexperience and refers instead to the usual methods for getting things done. When workflow is not well understood, the potential for error or inefficiency is increased. Orientation to clinical duty is largely "on the job" and "just in time" – for example, learning how to order blood products several months into the academic year, at the first time one needs to transfuse a patient. Opportunities to enhance safety may lie in more thorough orientation and transparent workflow processes. It is important that these remain "just in time" trainings, perhaps available on the intranet. It is tempting to run a very comprehensive orientation for the new cohort touching on all aspects of the job. However, knowledge and skills imparted during initial orientation are reinforced only when used, and imparting too much too soon only leads to a false sense of security that "we showed them how to do that, certainly they know."

By now, many readers are thinking of the role and obligation of the supervising attending physician. Shouldn't the inexperience of the trainees be irrelevant if they are indeed being properly supervised? Ideally, this would be true. However, attending physicians have the same human cognition limitations as everyone

else and therefore may also have some degradation in their overall performance as they add a higher level of teaching and supervision to their mental load. As well, they may be influenced by automaticity and habits that have developed over the prior months, during which time the attending has become habituated to depending on the skills and judgment of mature residents who are confident in their roles.⁶ The adjustment in habits and expectations necessary at cohort turnover would not be automatic. While it may seem obvious that attending physicians should increase the amount of mental effort deliberately focused on tasks that had previously required less attention, the brain has been conditioned to a particular allocation gradually over the concluding year and must suddenly make a shift. Because we are generally unaware of the precise development of our habits and semi-automated behaviors, it may be difficult to identify them in July and abruptly undo them.

Teaching institutions should build safeguards into their system that account for the change of cohorts. One might be to allow more time for cases in July to relax or mitigate production pressure. In particular, pressure to start the first procedure on schedule can be unsafe in this hectic time and should be relaxed. This is easy because it lies within the authority of the individual institution. Another might be to stagger the change in cohorts over several months, so that new surgical residents do not reach the O.R. in the same month as novice anesthesiologists. Many anesthesia programs do this already, to a greater or lesser degree. Simulation might offer another solution, especially if new teams can train together in advance of real cases and residents can be taught to advocate up the chain of command.⁴ Whatever the approach, however, every anesthesiologist with teaching responsibilities should be mindful of the potential for harm and should give some conscious thought to how it might be prevented.

References:

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