

Anesthesia Incident Reporting System (AIRS) Case 2022-2: Failure to Communicate

What We've Got Here Is Failure to Communicate

1. A first dose of ketorolac was given early by a different provider. After scanning the ketorolac at the end of the case, I did not confirm that any had already been administered. The error was discovered during handoff as I was communicating medications given. Additional fluids are currently being administered by the first provider as discussed during handoff. No immediate harm is evident.
2. The patient received two doses of acetaminophen during a case. It was not close to daily max or toxic dose, but it was more than the recommended single administration of 15 mg/kg. The staff was giving the resident a break and gave medication that had already been given.
3. A second dose of ketorolac was given to a patient during the case, totaling 60 mg.
4. Received sign-out that a Type 2 diabetic had a blood glucose of 180mg/dL in pre-op prior to emergency ex-lap for colonic obstruction. Treated hyperglycemia with intravenous insulin intraoperatively without knowledge that the patient had already received subcutaneous correction on the ward. The glucose was 39 two hours later, requiring a D50 bolus. The patient suffered no permanent harm.

These four safety reports tell a tale of inadvertent medication overdose in the familiar context of care team transitions. Care team transitions are necessary to combat the safety risks of fatigue and allow for continued vigilance, but they come with the risk of incomplete information handoffs and miscommunications. How can we best balance these competing safety tradeoffs?

The net effect of care transitions on surgical outcomes remains unclear, with some studies showing risk proportionate to the number of anesthesia providers in-



involved (*Anesth Analg* 2016;122:134-44; *J Cardiothorac Vasc Anesth* 2015;29:11-6; *Anesthesiology* 2014;121:695-706; *JAMA* 2018;319:143-53), while other studies show no correlation (*Anesthesiology* 2016;125:690-9; *BMJ Qual Saf* 2021;30:755-63). However, from the above examples as well as our collective experience, it is evident there is a need for strengthening intraoperative handoffs of care to ensure complete communication of the details of the case, regardless of whether it is a permanent handoff at the end of a shift or a mid-shift break.

The literature on intraoperative handoffs is sparse compared to handoffs for transitions of care in other clinical areas. There are several handoff tools available, but none that have been widely tested and accepted (*Anesth Analg* 2021;132:1563-75). At its core, a handoff tool is a cognitive aid meant to assist the clinician in giving a complete handoff and facilitate open communication with the incoming provider. An ideal handoff tool would integrate the new provider into the perioperative care team fully, without missing key information that is pertinent to the case. There is no consensus about what information should be included in a handoff to accomplish this goal, with checklists ranging from several short items (*AANA J* 2018;86:137-45; *Clin Teach* 2019;16:58-

63) to a full page of detailed questions (*Eur J Anaesthesiol* 2017;34:471-6). An example of common elements to include in an intraoperative handoff appears in the Table below.

Another important consideration in intraoperative handoff cognitive aids is the form factor. What type of cognitive aid will integrate best into your work environment where handoffs occur? Studies have ranged from paper-based checklists (*Eur J Anaesthesiol* 2017;34:471-6) to integrated handoff tools in the electronic health record (*Anesth Analg* 2015;120:96-104; *Clin Teach* 2019;16:58-63; *Ochsner J* 2011;11:99-101). What works best is going to depend on your workflow and work environment. An electronic health record checklist system is not going to be useful to the clinician who is not giving handoffs at a computer, for example. Institutions might even consider integrating paper checklists into perioperative areas with fewer available computers, such as preoperative holding areas, while using a computer-based checklist in areas with easy access to the electronic health record, like the OR.

Particularly relevant to these incident reports is the importance of documentation, both as a source of information for an electronic checklist and as a backup for information missed during a handoff. When documentation is kept up to date, we can always go back to remind ourselves of key details, like the timing of the last dose of neuromuscular blocker or how much pain medication the patient has received. While many clinicians may consider documentation errors, such as forgetting to document a medication (that was correctly given), to be relatively minor errors, these set the stage for subsequent overdoses by clinicians who are unaware that the medication was recently given. While direct patient care should always come before documentation, timely and accurate documentation is itself essential to safe patient care, especially during care transitions. The medical record should be easily accessible from the patient's bedside, both to facilitate documentation and to have details of the prior medications available at the time of decision-making. An accurate anesthetic

record serves as a written handoff to the next care team, complementing the verbal handoff. Both are pieces of the communication puzzle that prevent errors like those listed above from occurring repeatedly in the future.

Finally, a checklist or cognitive aid is only going to create meaningful change if it is used. The purpose of an intraoperative handoff is to communicate, and the cognitive aid is meant to facilitate that communication. There must be a shared belief that accurate and complete intraoperative handoffs are critical for safe patient care. When that belief is eroded by a sense of time pressure or a culture of production pressure, then our patients are placed at higher risk of incomplete communications. Implementing a new checklist is not enough; integrating that checklist into a culture of communication and shared sense of responsibility for safe handoffs will go much farther toward addressing the safety problem created by transitions of care. This communication and culture change should include figuratively lowering the barrier of the drapes – it is telling that the most missed item during intraoperative handoffs is the introduction of the new anesthesia team to the surgical team (*Anesth Analg* 2015;120:96-104; *asamonitor.pub/31k978f*). The culture change should also start at the top, with strong leadership investment. Examples include investing in team communication training to accompany the rollout of a new handoff tool or building in 30 minutes of overlap time between shifts to allow for handoffs without clinicians feeling rushed. Investing in a culture of communication is necessary for successful implementation of an intraoperative handoff tool.

These four overdose accidents fortunately resulted in no lasting harm to the patients, but they offer us a good opportunity to learn strategies to prevent similar events in the future. Preventing handoff errors involves a multifaceted approach of standardizing the handoff process, incorporating a cognitive aid, improving timeliness and accuracy of documentation, and building a culture of open communication. ■

Table: Common Elements of an Intraoperative Handoff

Demographics and surgical procedure
Past medical history/medications and allergies
Airway
Access
Fluid management and EBL
Perioperative medications (pain, PONV, neuromuscular blockers, vasoactives)
Antibiotics (dose and timing)
Intraoperative concerns (clamp time, tourniquet time, heparin dosing, labs, etc.)
Postoperative plan (disposition, extubation, etc.)
Introduction of new anesthesia team to surgical and nursing team

Each month, the AQI-AIRS Steering Committee abstracts a patient history submitted to AIRS and authors a discussion of the safety and human factors challenges involved. Absence of commentary should not be construed as agreement with the clinical decisions described. Reader feedback can be sent to airs@asahq.org. Report incidents or download the AIRS mobile app at aqiairs.org.