

## Anesthesia Incident Reporting System (AIRS) Case 2022-08: It's All About the Airway. What Would You Do?

This month's AIRS case reports are presented in a format that we have borrowed from NASA's CALLBACK, which discusses events that have been entered into the Aviation Safety Reporting System. We will let you "interact" with the information given in two events that have been reported to AIRS. In "The first half of the story," you will find report excerpts describing the management of a patient's airway up to a point where the anesthesia team must decide what to do next. You can then think about what you would do in a similar situation. How might you best resolve the problem that we've presented? You'll find out what the actual health care team did in "The rest of the story."

### The first half of the story

#### Case 1

*I was on call and was called to intubate a COVID-positive patient in respiratory failure. I suspected that the patient would have a difficult airway, so I asked for a videolaryngoscope. It was broken, as was the next one that they brought me. What would you do next?*



#### Case 2

*I was covering the airway pager. We were called to the floor to intubate a patient in respiratory distress. When we got to the room, the nurse casually mentioned that the patient had a retrosternal goiter. The patient was sitting up in bed and obviously dyspneic. He was unable to lie flat. We debated whether to bring the patient to the OR in case a surgical airway was required. What would you do next?*

### The rest of the story

#### Case 1

*I eventually did a direct laryngoscopy with a Mac 3 blade and got the tube in. The hospital*

*has recently switched to an off-site, nationwide biomedical engineering firm. I was told that I had to go to a website to report the broken screens and that "someone" would come by and repair them on the next business day. Tightening the supply chain and moving more services off site will definitely affect the care that our patients receive.*

#### Discussion

Health care systems have started to outsource services such as housekeeping, food service, laundry, and biomedical engineering. Hospital executives choose to outsource support services to reduce operating costs, but this only works if the outsourced service actually performs as promised (*Hosp Health Netw* 1999;73:46-52). Unfortunately, there are very few studies that examine the effects of outsourcing critical support services (like biomedical engineering) on health care delivery (*European Journal of Operational Research* 2012;221:186-97). It seems obvious, however, that in this particular hospital, the system is not working as intended. Should a hospital's outsourcing contract provide

for at least some personnel on site who can diagnose and repair malfunctioning equipment?

Cruz et al. studied the effectiveness of outsourced biomedical engineering services. In their study, factors that determined the quality of the maintenance service included user training, how far the company was from the hospital, the complexity of the equipment, and the number of maintenance visits performed by the company (*Biomed Instrum Technol* 2013;47:524-35). A study of information technology (another commonly outsourced service) suggests that senior managers make the decision to use an outside company for a variety of reasons, including overall performance of the company in question, poor cost control, short-term cash needs, and managerial self-interest (*Journal of Management Information Systems* 2014;22:193-221). One important message to draw from this case is that equipment maintained by an independent vendor may not be repaired immediately, especially if the company requires that

the medical staff create an account on a website and find a QR code on the broken device.

This case also offers several practical lessons about equipment failures. Of course, we should always check a critical piece of equipment before using it, as this team did. A bad situation could have been much worse if the malfunction was discovered after the patient was sedated for intubation. As medical equipment becomes more sophisticated, it becomes more difficult to troubleshoot when things go wrong. We should all be prepared to manage unexpected equipment failures (even a "simple" device such as the videolaryngoscope in this report) (*Anesthesiology* 2020;133:653-65). To this point, there has been some discussion about whether direct laryngoscopy is still relevant in the modern practice of anesthesiology. In fact, a recent Cochrane review stated that videolaryngoscopy is unequivocally superior to direct laryngoscopy (*Cochrane Database Syst Rev* 2022;4:CD011136). This case presents a powerful argument for maintaining the skills needed to use equipment that is relatively simple in design and less prone to failure. This case also highlights our professional obligation to address systematic issues that threaten patient safety. We should all make it our personal mission to call out management decisions that can harm our patients.

#### Case 2

*We decided that the patient was too unstable to transport, so we called the ENT service and asked them to stand by with a rigid bronchoscope and tracheostomy set. We were able to stabilize the patient while we got the ENT service and their equipment*

*to the patient's bedside. We used lidocaine to anesthetize the patient's airway and then intubated the patient with a flexible bronchoscope and no sedation. Everything went well. Lessons learned: ensure that all available resources are available when managing a critical airway.*



#### Discussion

In this case, the anesthesia team was faced with a difficult decision. The patient's retrosternal thyroid was about to completely obstruct his airway. The team considered transporting the patient to the OR and managing the airway there but decided that he was too unstable to move. Managing this patient's airway on the floor is risky. The upper airway was patent, and an endotracheal tube could conceivably have been passed through the vocal cords. After intubation, however, the lower trachea might collapse when the patient was sedated and placed in the supine position, completely obstructing the airway. Even though the ENT team had brought the equipment that they might need, they would be doing a rigid bronchoscopy in a hospital bed in an area with fewer resources and personnel.

Attempting to intubate a patient who may quickly need a surgical airway or even extracorporeal membrane oxygenation is risky, but so is transporting a patient about to experience complete airway obstruction. A patient in impending respiratory failure may be more

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](mailto:airs@asahq.org). Report incidents or download the AIRS mobile app at [www.aqiairs.org](http://www.aqiairs.org).



susceptible to the physiological changes associated with movement through the hospital (e.g., a different ventilator). It may also be difficult for the team who is responsible for transporting the patient to identify or predict continued deterioration. Equipment that the team may need to manage the problem will be unavailable (*Biomed Instrum Technol* 2013;47:524-35). If the patient decompensates in a hallway or elevator, there will be no backup supplies, and nobody else will be available to help.

Transporting the patient to a higher level of care is an area of particular concern, as is transporting the patient to an emergency procedure. Beckman et al. found that 35% of critical events reported while transporting a patient occurred while they were being transported to the ICU, and 8% took place during an emergency intervention (*Intensive Care Med* 2004;30:1579-85). In this case, the team intubated the patient where he was, and it worked out well. Key contributors to the team's success were their decision to call the ENT service to the bedside and to prepare for a surgical approach to the airway. Fortunately, the airway equipment worked in this case. Decisions like these are addressed in ASA's new guidelines for airway management, which state that the approach to airway management should take into account the context of hospital resources, operator experience, and patient acuity (*Anesthesiology* 2021;136:31-81).

This case had a successful resolution, but the anesthesia team was required to make some high-stakes decisions quickly and without knowing much about the patient's airway. If things had gone badly, those choices would almost certainly have been questioned either at a departmental CQI meeting or a hospital root cause analysis. The outcome was at least partially based on chance: fortunately, the distal airway did not collapse because the anesthesia professional was able to position the tip of the endotracheal tube past the goiter. If the tube had been a little shorter, or the thyroid a little larger, the outcome could have been catastrophic. On the other hand, if the team had decided to move the patient to the OR, he could have had a respiratory arrest on the way. Either way, it would be tempting to blame the poor outcome on the person caring for the patient. This is called *hindsight bias* (*The Field Guide to Understanding Human Error*. Second edition, 2006). When reviewing a case like this, we must avoid making the assumption that the team who cared for the patient had access to information that was only available in retrospect. ■

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