Learning From Others:

A Case Report From the Anesthesia Incident Reporting System

Anesthesia Quality Institute
ANESTHESIA INCIDENT REPORTING SYSTEM (AIRS)

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 **airs@asahq.org**. Report incidents or download the AIRS mobile app at **www.aqiairs.org**.

Presentation of case:
Patient exposed to syringe from previous case due to multiple factors (rushed turnover, miscommunication about pre-drawn syringe vs. new vial, and unwasted drugs from previous case). Surgeon, risk management, and laboratory were notified. Source patient notified about having labs drawn and will have them drawn later. Surgeon will discuss after redraw.

Lesson Learned:
Always discard patient's medications once case is over.
Take time to put the patient first when the case is over – don't rush.

Hazards of infection in the O.R. related to anesthetics have been frequently discussed and are usually considered in relationship to events such as improper sterilization of airway equipment, neglect of or inadequate sterile technique when drawing up or injecting drugs into intravenous lines, or breaks in sterile technique for regional anesthesia. These are all serious patient safety hazards and have been generally addressed by educational efforts that highlight the infectious risks for our patients regarding careless practices. However, this case highlights a serious infection hazard related to multiple system problems that have the simultaneous possibility of producing patient harm.

Numerous reports of infections stemming from "shared" drug administrations have been reported, including both accidental events and discredited intentional practices. Even the drawing up of a drug for multiple patients from single vials has been associated with infectious transmission. Certainly, injecting into the intravenous lines of more than one patient from a single syringe is a practice that can be expected to increase the risk of infection should one patient be infected with a pathogenic agent. There are five factors that Sikora et al. numerated to quantify the risk in such a scenario: "1) the population prevalence of a specific bloodborne pathogen, 2) the probability of finding a viral bloodborne pathogen in an intravenous circuit, 3) the rate of syringe reuse, 4) the probability of causing disease given a bloodborne pathogen exposure, and 5) the susceptibility of the

exposed person." Using these parameters, they estimated the transmission risk for several viral diseases, including hepatitis B, hepatitis C and the human immunodeficiency virus, which ranged from a high of 12 to 53 events per million (hepatitis B) to 0.03 to 0.15 per million (for HIV). While these numbers appear to be exceedingly small, one must remember that all such events are entirely preventable by adherence to good aseptic practices and that the numbers increased tenfold when the injection was performed through a more proximal port in the intravenous tubing set.

It is well known that propofol, because of its lipid vehicle, is prone to support bacterial growth, resulting in recommendations regarding precautions about how long syringes of the drug may be used after the drug is drawn up. But there are less obvious additional risks of contamination. Residual propofol trapped within a stopcock may pose a risk. In one study, positive bacterial cultures were obtained from 16-20 percent of I.V. stopcocks after propofol anesthesia and 12-32 percent of stopcocks in which propofol was not injected. Even cursory swabbing of injection ports may not be effective in eliminating the risk of bacterial contamination of intravenous lines.

While injection practices have drawn the most scrutiny, the aseptic practices of drawing up the drug from the vial must also be considered. In a simulation study, several aliquots of anesthetic drugs were drawn up into syringes and cultures obtained over time. Although even one sample was found to be contaminated immediately, there was an incremental increase in contamination up to eight hours. The authors suggest that the practice of drawing up drugs in advance by anesthesiologists for use in subsequent cases is a potential infection risk and should not be countenanced.

In our case, the injection was accidental, due to the mix-up of a syringe used in a previous case. The reporter identified several factors that set the stage for this event. Production pressure has been identified in many adverse events previously discussed in this column and has been recognized as a patient safety hazard in anesthesia practice for at least 25 years. What is particularly notable in this case is that the anesthesiologists employed a common practice intended to alleviate one aspect of production pressure (i.e., having drugs drawn up in advance) that instead actually introduced a new risk. We often observe residents, anesthetists and attending physicians drawing up drugs for the next case during a case in progress, or even at the beginning of the day, a practice intended to allow one to increase efficiency in turning over the O.R. While the infection risks, as noted above, should lead us to question this practice, it also may increase the hazard of syringe swaps, particularly if under time pressure one neglects to discard remaining drugs immediately at the termination of the case. Labeling alone will not mitigate this risk; anesthesiologists care for a single patient at a time, and checking the identity of the patient with a name label on the syringe, as is standard practice in nursing, is generally impractical. Several more effective solutions, however, are not difficult to conceive of or implement. First, the practice of drawing up drugs in advance should be questioned, and strong consideration should be given to always drawing up drugs for a patient only once the previous patient has been transferred to the recovery room and the used drugs discarded. Second, alternative means of preparing drugs for our patients should be considered. Many of our drugs can be obtained in commercially pre-filled syringes. This reduces the risk of several additional hazards, including infection and contamination (drugs are packaged in their syringes under high-level aseptic conditions) and misidentification (drugs are labeled at the source). While the reporter also identifies communication as one of the factors contributing to this error, this mechanism can be in large part eliminated if one never expects that drugs for the next case are pre-drawn and that new drugs are never drawn up until the discards from the previous case are discarded.

While the lesson learned noted by the reporter to not rush and take time to put the patient first is certainly the correct one, many of our systems contain strong incentives, whether explicit or hidden, to do just the opposite! As advocates for patient safety, we should encourage reform of these incentives to enable us to stand up to production pressure and place our patients first.

Should an event like our case occur, it is critical that the patients be identified, notified and tested. While the absolute risk of infection is low, asymptomatic carriers of numerous serious viral diseases such as hepatitis and HIV pass unknowingly through our O.R.s every day. As in all cases of medical error, full disclosure should be the rule.

Bibliography:

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