THE COST OF LEARNING FROM OUR MISTAKES

Everyone makes mistakes, and we must all learn from them so that we do not repeat them. We hope that the cost of our mistakes is not overwhelming. Some mistakes that occur early in our educational experience help shape our philosophy of life for the future. I vividly remember one such mistake that occurred when I was in pharmacy school. Dr Albert C. Smith, our professor for advanced physical chemistry, gave our class an unannounced quiz one morning and returned the graded papers to us the following day. It was a very difficult quiz that involved multiple mathematical calculations. Everyone in our class received a zero except me. I received a double zero, and after class, Dr Smith asked me to come forward to see him. He said, "I bet you are wondering why you got a double zero," and I replied that I was indeed surprised because I had the correct answer...well almost correct, except for missing the placement of the decimal point. His response was that if this had been a compounding chemotherapy prescription calculation in a hospital pharmacy, the other students would not have been able to deliver the end-product to the patient because they didn't have the answer, so some other pharmacist would have had to make the correct drug preparation to safely and effectively treat the patient. However, having figured out the correct answer except for the decimal point, I would have undoubtedly delivered a drug product that would have been either 10 times too dilute to cure the patient or 10 times too concentrated and probably could have seriously injured the patient.

What a profound life-changing lesson I learned that day from my mistake, and the best part was that an adverse effect did not have to happen to a patient for me to learn it. This mistake cost me little, certainly insignificantly compared with what a careless mistake might have cost in the real world. Dr Smith wisely pointed out that when given a professional responsibility, a true professional must be as accurate as humanly possible. I never forgot that lesson.

Among the multitude of possible errors that might prove very costly to those of us who administer moderate or deep sedation or general anesthesia, this editorial addresses the potential mistake of administering the wrong drug or the wrong dose. Many drug vials look very similar to one another. The spelling on the labels, such as ephedrine and epinephrine, also look similar. The same drug may be marketed in several concentrations, and without careful reading of the label, a different concentration from what we routinely

use may not be recognized. For instance, midazolam is marketed as 1 mg/mL and 5 mg/mL, meperidine as 50 mg/mL and 100 mg/mL, and ketamine as 10 mg/mL, 50 mg/mL, and 100 mg/mL. Even though an office may always order only one concentration of a drug from a wholesaler, an incorrect drug in a similar package or an incorrect concentration of the correct drug may be mistakenly delivered, which increases the potential for its inadvertent administration if the mistake is not recognized.

The Joint Commission, formerly the Joint Commission on Accreditation of Healthcare Organizations, requires hospital personnel to label all syringes with the name and concentration of the drug. Color-coded commercial labels that stick on syringes make labeling very convenient, with the midazolam label being orange and the fentanyl label being blue. However, drugs in the same class often have the same colored label. Thus, when more than one narcotic is intended to be used for deep sedation or general anesthesia, such as a 2 mL syringe of fentanyl intended as a pre-induction intravenous bolus for initiating sedation, or a 2 mL syringe of remifentanyl intended for injecting into a continuous infusion of propofol for maintaining anesthesia after induction, the two syringes with blue labels could be mistakenly switched. If the dentist does not carefully read the label and mistakenly picks up the remifentanyl syringe, thinking that it is fentanyl, the resulting bolus of remifentanyl will immediately cause chest wall rigidity, precipitating a sedation/anesthetic crisis. We also must never assume that the color of the plastic cap on a vial identifies what is in the vial, even though previous shipments of generic dexamethasone, for example, have always had pink caps. The truth is that many different drug vials have pink caps. There are no standard colors for drugs because there are many more drugs than there are colors. Professionals must recognize that we are creatures of habit, and this makes us prone to making mistakes during repetitive tasks. Because we know that misidentification of drugs is a common error, we must double our efforts to ensure that we have the correct drug, the correct concentration, the correct dose, and the correct patient for that drug. Because of potential serious harm to the patient and disgrace and liability for the doctor if a mistake causes harm, I believe that only trained, licensed health care professionals should be permitted to select the desired sedative/anesthetic drug and draw it into accurately labeled syringes. They should also be the only personnel for example to select an oral sedative liquid drug such as midazolam syrup and to accurately measure the dose to be administered to a

child. If we dentists are ultimately responsible for every aspect of the patient's treatment, we cannot afford to delegate these critical responsibilities to those who are not properly qualified. After my double zero, I vowed to double-check every calculation and every drug label. As a pharmacist and later as a dentist anesthesiologist, I still double-check the label on every drug that I draw into a syringe from the stock vial, double-check that every syringe I fill is correctly labeled, and double-check that every labeled syringe that I administer to a patient is correct. I feel that that is my professional responsibility, and that if a mistake occurs, I have only myself to blame.

Great value can be derived from attending continuing education courses in which morbidity and mortality conferences are conducted to hear the mistakes of others so that we don't repeat their mistakes. However, it is only human nature to deny that such a mistake could ever happen to us, and that the practitioner

discussing a case was unlucky or incompetent. We are all human, and we are prone to make mistakes, so we must do whatever we can to minimize the chances of making those mistakes to ensure the highest level of patient safety.

The cost for my mistake that changed my lifetime practice habits was only a bad quiz grade, but it exposed my vulnerability to make a preventable mistake that could be costly. We should look for other weaknesses in our safety systems that could be our own double zero grade and fix them before we are tested, thereby preventing costly mistakes before they happen.

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