



Clinical Pharmacology & Toxicology Pearl of the Week

~ Medication Errors and Solutions, Part 1 ~

Case

- ✓ A 45-year-old woman was brought to the ED of a regional hospital by ambulance. She had been found unresponsive by her boyfriend. It appeared that she had taken a mixed overdose, including a tricyclic antidepressant. Her pulse was 130 beats/min and her BP was 105/50 mm Hg. Her GCS was 7.
- ✓ She was prepared for rapid sequence intubation. The emergency physician called for “5 of midazolam IV” for induction, administering it himself by slow IV push over 2 minutes, and the patient was successfully intubated.
- ✓ Shortly afterward, as the record was being completed, the recording nurse confirmed with the physician the medication that had been given, specifically that 25 mg of midazolam had been administered.
- ✓ The physician corrected her, saying that he had given 5 mL of a solution containing 1 mg/mL of midazolam, for a total of 5 mg.
- ✓ The nurse informed the physician that, in fact, he had been given a solution containing 5 mg/mL of midazolam and that the patient had, therefore, received a total of 25 mg.
- ✓ The patient appeared to suffer no adverse consequences from the medication overdose. Specifically, there were no cardiac arrhythmias from the propylene glycol diluent. She was further stabilized and was transferred to the intensive care unit (ICU) where she made an uneventful and full recovery.

Background

- ✓ There are five steps in the sequence of ordering a drug to its delivery:
 - Prescription
 - Transcription
 - Dispensing
 - Administration
 - Monitoring
- ✓ Each of these stages represents a vulnerable link in a chain along which any variety of errors can occur. A breach along any one of the links in the chain may lead to an adverse drug event.
- ✓ In general, errors in healthcare can be divided into cognitive (human) and system errors.
- ✓ This pearl will focus on medication errors within each of these five steps.

1. Prescription

- ✓ The two most common factors associated with prescribing errors are:
 - Lack of knowledge pertaining to the drug prescribed
 - Lack of knowledge regarding the patient for whom the drug is prescribed

2. Transcription

- ✓ Transcribing errors occur when there is a breakdown in communication between the prescriber and the person dispensing or administering the medication.
- ✓ This may be caused by an oral order being misinterpreted or ambiguous (i.e., verbal orders, poor communication), or it may be from poor handwriting.

3. Dispensing

- ✓ Dispensing medication is the process of providing the medication to the person who will administer the drug.
- ✓ Errors may occur when physicians dispense medications, nurses dispense medications to themselves, or medication is dispensed to the wrong patient.

4. Administration

- ✓ Administration of a drug is the act of physically placing the drug into the body of a patient.
- ✓ Administration errors occur when:
 - The wrong drug is administered.
 - The right drug is administered in the wrong dose or via the wrong route, or with an incompatible co-administered drug.
 - When the right drug is given to the wrong patient.

5. Monitoring

- ✓ Two types of monitoring are important in the safe administration of medications:
 - When a drug is administered, appropriate monitoring of the patient for side effects and toxicity should be initiated. The level of monitoring required will vary with the patient circumstances and with the nature of the pharmacologic agent employed.
 - Errors can occur in having a medicated patient leave the hospital (e.g., post sedation).
 - Certain medications require outpatient monitoring to confirm efficacy or to identify complications. For example, some drugs, such as warfarin, require periodic INRs.
 - Errors can occur when patients are not given proper discharge instructions (e.g., verbal instructions to a patient given an amnestic drug).

Reference:

1. Croskerry et al. Acad Emerg Med March 2004. Vol 33, No 3. 289-299.

The Clinical Pharmacology (CP) physician consultation service is available Mon-Fri, 8am-5pm. The on-call physician is listed in ROCA on the AHS Insite page. CP consultations are also available through Netcare e-referral, Specialist Link and through RAAPID. You can also find us in the [Alberta Referral Directory](#) (ARD) by searching "Pharmacology" from the ARD home page. Click [HERE](#) for more details about the service.

The Poison and Drug Information Service (PADIS) is available 24/7 for questions related to poisonings. Please call 1-800-332-1414 (AB and NWT) or 1-866-454-1212 (SK). Information about our outpatient Medical Toxicology Clinic can be found in [Alberta Referral Directory](#) (ARD) by searching "Toxicology" from the ARD home page.

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