



Computer-generated MAR format needs a team revision

The way that drug orders are presented on computer-generated medication administration records (MARs) from pharmacy may be confusing. On many pharmacy computer-generated forms, medication entries typically first list the medication name followed by the strength available in the pharmacy, then the number of tablets or volume of oral or injectable liquid needed to equal the patient's prescribed dose. Thus, the drug name and available dosage strength appear on the top line(s), and the patient's actual dose appears below. This presentation matches what's listed in the pharmacy inventory (see photo below); but nurses often think first about the dose they must give, and secondly about the number of tablets or volume of liquid needed for the dose. Their eyes are naturally drawn to the top-most line(s) of the MAR to locate the patient's dose. Errors are possible when the patient's dose differs from the available dosage strength listed on the top line.

Nurses' eyes are naturally drawn to the top-most line of MAR entries to locate the patient's dose

DAPSONE 25 MG TAB
(DAPSONE)
12.5 MG (0.5 TAB)
PO DAILY

For example, a hospital patient received cyclosporine 50 mg IV after

a nurse misinterpreted the 50 mg/mL dosage strength listed in bold on the top line as the patient's actual dose, which was listed as 30 mg on a subsequent line. In another case, a patient received 2 mg of digoxin after a nurse misinterpreted the total volume dispensed in the bottle (listed boldly on the first line as "Digoxin Elixir 0.05 mg/mL 60 mL") as the patient's dose, which was listed below (0.125 mg). The error was detected after the nurse gave the patient the amount left in the bottle (40 mL) and called the pharmacy for the remaining 20 mL.

Another error involved administering a single tablet that matched the available tablet strength listed on the first line, but the patient's dose required two tablets. Similar errors often go unrecognized and likely account for some of the doses returned to the pharmacy in patient drawers/supplies or account for calls to pharmacy for missing doses.

Pharmacy computer-generated MARs guide drug administration far more safely than handwritten MARs. However, an interdisciplinary interchange is paramount to assure that the presentation of drug orders is clear to nurses. See **Check it out!** for suggestions regarding safe presentation of drug information on MARs.

check it out! ✓✓✓✓

Consider these suggestions to avoid medication errors from pharmacy computer-generated MARs:

- ✓ **Don't compromise on safety!** When new computer systems are being purchased, insist upon the capability to customize the MAR. If a new system will not be purchased soon, help justify the cost for customizing existing systems by documenting each time the MAR format contributes to an error. Your administrators may gain a new perspective and allocate the funds for change.
- ✓ **Assess and communicate.** Hold nursing-pharmacy meetings to identify and prioritize MAR format problems that could contribute to errors. Include information system staff in the meetings so they understand the problems and can work with the pharmacy software vendor to make changes.
- ✓ **Determine the ideal.** The ideal presentation for nurses would list the drug name (generic and brand) on the first line; a bolded patient-specific dose, route, and frequency (and indication, if applicable) on the second line; and strength or special instructions (e.g., 50 mg = 2 x 25 mg tabs) or warnings (e.g., IM only) on the third.
- ✓ **Dispense patient-specific unit doses.** Ask pharmacy to dispense medications, when possible, in patient-specific doses (e.g., exact warfarin strengths, half tablets when needed, exact volumes of oral solutions in oral syringes). If multiple tablets are needed, ask pharmacy to dispense the doses together or attached in some way, and affix a proper label. If oral liquid medications must be dispensed in multiple-dose bottles, ask pharmacy not to list the container's total volume on the MAR.

pearls for patients



Swallow Avinza capsules whole. AVINZA (morphine sulfate extended release) capsules are considered the first once-daily product for round-the-clock pain control. The formulation, which contains both immediate-release and sustained-release morphine beads, may benefit patients who need 24-hour opioid therapy for an extended period of time. Because it's an extended-release medication, a potentially fatal dose of morphine could be rapidly released if the Avinza capsule is crushed or chewed. So be sure to teach patients and

continued on page 2

Pre-procedure sedation of children should not be given at home

A physician prescribed chloral hydrate 500 mg for a 17-month old girl, intending the parents to give the medication prior to the child's office visit for a procedure. Unfortunately, he used double hash marks (") as a symbol for minutes, when it really stands for seconds (see photo below).

Chloral hydrate
500 mg
30 min before office visit

This confusion led the pharmacist to misinterpret the double hash marks to mean "cc," thus dispensing 30 mL of a 500 mg/5 mL concentration of chloral hydrate without realizing the child would receive a 3,000 mg single dose! The child became comatose shortly after her mother gave her the large dose. She was rushed to the hospital where fortunately, she was resuscitated without subsequent harm. But, tragically, we know of other children who died after receiving accidental overdoses of chloral hydrate at home.

One event occurred because the dose had been prescribed by volume (teaspoons). The physician assumed that a

250 mg/5 mL concentration would be used to fill the prescription, but the pharmacist filled it using a 500 mg/5 mL concentration. The child received a two-fold overdose. In another event, the original prescription instructed the mother to give her child "12 mL" of chloral hydrate, but the pharmacist dispensed a 120 mL bottle labeled with instructions to give the entire bottle before a procedure.

Inpatient and outpatient healthcare providers should abandon the practice of asking parents to administer sedation to their children at home. According to the American Academy of Pediatrics, children should not receive sedatives (e.g., chloral hydrate, midazolam [VERSED]) or anxiolytic medications without supervision and monitoring by skilled medical personnel and readily available, age/size appropriate resuscitation equipment (and reversal agents when applicable).

To accomplish this, one hospital designates an inpatient bed and a pediatric nurse to admit, medicate, monitor, and transport all outpatients receiving moderate sedation. We would like to hear your experiences with pediatric pre-procedure oral sedation. Write to us at: nursing@ismp.org.

pearls for patients

continued from page 1

caregivers that Avinza capsules must be swallowed whole. Document these instructions in the medication administration record and include them in the patient's discharge notes. If the patient has difficulty swallowing the capsule, alert the physician that another form of analgesia may be required.

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Report medication errors to ISMP at 1-800-FAIL-SAF(E).

Message in our mailbox



Q: From a reader:

I just reviewed the **Nurse Advise-ERR™** issue from September 2004. The article on

multiple-dose vial (MDV) use did not mention insulin. Are there specific recommendations for insulin?

A: From an infection control point of view, the most vulnerable multiple-dose vials are those that are frequently entered more than once during a single episode of care. This includes vials of saline and heparin (used for flushing IV access sites), and topical anesthetics like lidocaine. If you need just a little more lidocaine, or just a little more flush solution, for example, you could easily forget to use a clean syringe (and needle, if used). While insulin vials are used for many different patients, it's unlikely that the vial would be re-entered more than once per patient. Thus, the risk of cross contamination is lessened as long as the rubber stopper is properly decontaminated. If MDVs of insulin are kept at room temperature (for convenience and to limit irritation at the injection site), the two top manufacturers of insulin products, Novo Nordisk and Eli Lilly, both recommend discarding the vials 28 days after the first use.

From an error perspective, MDVs of insulin have been mixed-up with vials of other types of insulin, as well as heparin, saline, and bacteriostatic water. While the best solution is for pharmacy to dispense patient-specific doses of insulin drawn into a syringe, this may not be practical; nor is dispensing insulin in patient-specific vials (although some hospitals follow this practice). To avoid mix-ups, do not keep insulin vials on top of medication carts, or on medication room counters where they can be confused for another medication or solution.