



Patches: What you can't see can harm patients

Transdermal patches are used as a drug delivery system for a number of pharmaceuticals. The medicated adhesive patch is placed on the skin to deliver a time-released dose. Before applying a new patch, the existing patch must be removed, as medication often remains available in the patch even after its recommended duration of use.

To remind nurses to remove an existing patch before applying a new one, many hospitals include this step, along with the drug listing, as a discrete item on medication administration records (MARs). To help find the patch, the location of application is included when documenting the patch placement. Nevertheless, old patches have been left in place inadvertently, often because nurses do not know a preexisting patch has been applied, or they have difficulty finding the existing patches.

Many transdermal patches are clear or translucent making them nearly invisible on the skin. Although the drug name may be printed on the patch, visibility may still be poor, and with some products, the printing has rubbed off during use. Thus, patch removal may be missed, potentially leading to an overdose as in the following example.

A patient who had been receiving transdermal fentanyl 100 mcg per hour every 72 hours had a second patch applied after the nurse could not find the clear, existing patch. The location of the first patch had not been documented. The patient became severely obtunded, which led to a full work-up for a stroke. Three days later, the initial clear patch was found on the patient's thigh (not a recommended site). The patches were

removed, naloxone was administered, and the patient fully recovered.

Adverse events have also occurred when, upon admission, patients forgot to mention that they were using transdermal medications at home.

In one case, an obese woman admitted to the ED with chronic pain, failed to mention the fentanyl 75 mcg per hour patch she was wearing. The patient was admitted to a medical unit with orders for a fentanyl patch 50 mcg per hour every 72 hours, which was applied that evening, and IV morphine for breakthrough pain. The next day, the patient was found unresponsive. She was intubated, given naloxone, and transferred to ICU. A nurse later found the fentanyl patch applied at home, deep within a skin fold. The patch was removed and the patient recovered.

Patches have been left in place, often because nurses have difficulty finding the existing patch.

Another situation in which patches are not always removed happens during transitions in care, as noted below.

Preoperatively, a scopolamine patch was placed behind the ear of an elderly man undergoing a cardiac catheterization. The patient had compromised renal function but no history of central nervous system symptoms. Three days later, he developed delirium, confusion, restlessness, and myoclonic jerks. The patient's daughter noticed that the patch had not been removed postoperatively as prescribed. She told a nurse, who then removed it. The patient's symptoms gradually subsided.

Please see **check!out!** for suggestions to help ensure that existing patches are removed upon discontinuation or before application of a new patch.

check!out! ✓✓✓✓

To help ensure that existing patches are removed upon discontinuation or before application of a new patch:

✓ **Document.** Along with the drug entry on the MAR, include a prompt for a second entry so nurses can document the location and time of applying and removing the patches. If computer-generated MARs are used, build this into the order entry program so that it automatically appears on the MAR when a patch has been prescribed.

✓ **Ask the patient.** Before applying the first dose of a newly prescribed patch, always ask if the patient has an existing patch on the skin and where it is located.

✓ **Make no assumptions.** Do not assume a patch has fallen off. Fully examine the skin, especially if patients are confused, sedated, unresponsive, or exhibit drug-seeking behavior.

✓ **Facilitate disclosure.** When obtaining an initial list of medications taken at home, specifically ask patients about drugs such as patches, inhalers, eye drops, topical creams, and other medications administered by routes other than oral. Be sure medication reconciliation forms are updated to include prompts for non-oral medications.

✓ **Apply auxiliary labels.** If patches are clear, apply a more noticeable auxiliary label to the patch, taking care not to obscure any existing drug information. (A pen may puncture the patch if markings are made directly on the patch.)

✓ **Reconcile removal.** When patches are meant for one-time placement (e.g., preoperatively), discontinued, or not reordered upon transfer, be sure that removal of the patch is documented on the MAR.

ADC stocking error contributes to wrong strength dopamine infusion

In an emergency department, a dopamine infusion was prescribed to maintain a patient's blood pressure. The nurse removed a bag of dopamine from an automated dispensing cabinet (ADC) and began the infusion, believing it contained the usual total concentration of dopamine stored in the ADC of 400 mg/250 mL (1,600 mcg/mL). Instead, the bag actually contained 400 mg/500 mL (800 mcg/mL), which had been accidentally stocked in the ADC in an area where the 250 mL bags of dopamine (400 mg/250 mL) were usually stored. Although the two concentrations came in different volumes of solution, both bags (from Baxter) looked similar in foil overlays with red labels, making it difficult to distinguish between them.

As a result of the error, the patient's blood pressure was difficult to maintain. The nurse thought the patient was already receiving the maximum dose of dopamine, so other measures were taken. Despite these efforts, the patient arrested and could not be

resuscitated. The role that the error played in the patient's death, if any, is uncertain.

A search of the USP-ISMP Medication Errors Reporting Program (MERP) database reveals that dopamine is among the top 10 drugs involved in errors in which ADCs are the source of the drug (see Table below). As we have often mentioned in past publications, a pharmacist should always check all medications that a technician pulls for restocking of ADCs before the products leave the pharmacy. (Or, if necessary, a technician should double check the medications pulled by another technician if a pharmacist is unable to do it.) If possible, use a standard concentration of dopamine throughout the hospital. Additionally, bar-code technology should be employed whenever possible when selecting and stocking medications in ADCs, as well as before administering the medications removed from ADCs.

As an added measure of safety, all organizations should review the list of the top 10 drugs removed from ADCs that have been involved in errors (see the Table to the left) and ensure that appropriate safeguards are in place. Most of the drugs in the Table are already on the ISMP list of high-alert medications (www.ismp.org/Tools/high-alertmedications.pdf). Performing a failure mode and effects analysis (FMEA) for the processes used with each drug would uncover potentially harmful safety breaches that could be remedied. See our February 2004 newsletter (www.ismp.org/Newsletters/nursing/backissues.asp) for more information about the FMEA process.

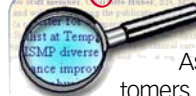
Top ten ADC medications involved in errors*:

1. morphine
2. heparin
3. oxycodone
4. diltiazem
5. ketorolac
6. meperidine
7. dopamine
8. hetastarch
9. methylegonovine
10. promethazine

*based on error reports sent to USP-ISMP MERP

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analysis shows...



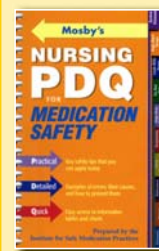
Cabinet overrides.

As a service to its customers in 2006, McKesson

Medication Management conducted an informal analysis of data from several thousand automated dispensing cabinets (ADCs), which showed that half (50%) of the cabinets allowed nurses to obtain **all** medications via override. These cabinets were not connected to the pharmacy computer, so a pharmacist's review of the medication orders often did not occur before the medications were removed and administered. The remaining 50% of ADCs were connected to the pharmacy computer. Of these, about 16% of medications were obtained via override, consistent with previous findings. Drugs were removed from cabinets in Labor and Delivery units and ICU via an override about 30 to 50% of the time, compared to just 5% of the time on medical-surgical units. These averages, across a broad spectrum of hospital sizes, pharmacy hours, and vendor systems, give a general sense of how often non-urgent medication orders are not reviewed and screened by a pharmacist before drug administration, as required by The Joint Commission. Careful review of weekly/monthly reports regarding use of the override feature to remove drugs from ADCs should be a priority in hospitals to reduce the frequency with which medications are administered before pharmacy has screened the order for safety.

May 6-12, 2007: National Nurse Week Nursing: A Profession and a Passion

National Nurses Week is a great opportunity to thank nurses for their contributions to patient safety by presenting them with **Nursing PDQ for Medication Safety** prepared by ISMP. This pocket-sized ref-



erence is an excellent resource for quick facts and error-reduction strategies related to **high-alert medications**, look-alike drugs, high-risk procedures, assessing risk, error reduction, error reporting, medication administration, and much more. For

additional information and to place an order, please visit the ISMP Web site at: www.ismp.org/NursingArticles/Nbook.htm.