

ISMP Medication Safety Alert! [®] Acute Care

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Safety Briefs



Too much HYDROmorphone.

A 40-year-old, healthy man visited a hospital emergency department for severe throat pain. At the hospital, staff administered 2 mg of IV **HYDROmorphone (DILAUDID)** around 8 a.m. The patient was later transferred to a nursing unit in the hospital. The nurses gave two additional doses of IV **HYDROmorphone** 2 mg prior to 5 p.m. The patient had rarely taken opioids before admission except **VICODIN** (acetaminophen and **HYDROcodone**), which had not been tolerated well. The patient's wife mentioned this information, which was noted in the patient's chart. Unfortunately, the patient suffered a respiratory arrest. He was resuscitated but sustained permanent CNS impairment and died. The death was reportedly related to the **HYDROmorphone** dosing. The question must be asked whether **HYDROmorphone** was an appropriate analgesic for throat pain. Even if it is, patients should not receive high initial doses of opiates, especially **HYDROmorphone**; 2 mg IV is equivalent to approximately 12 to 14 mg of IV morphine, an extremely large dose for anyone who has not been on opiates in the past. Another analgesic, even non-narcotic, may have been a safer choice and adequate to relieve the patient's pain.



Patient safety increased in obstetrics.

A study published in the May issue of *American Journal of Obstetrics and Gynecology* indicates that a safety nurse position, created to oversee a comprehensive patient safety program, helped cut adverse obstetrical outcomes by 40%. An AMA News article about the published study (www.ama-assn.org/amednews/2009/05/18/prsb0518.htm) noted that the hospital had created the position of obstetrics safety nurse to help collect data and improve adherence to three dozen protocols and guidelines. The nurse runs the event reporting system, reviews neonatal logs daily, formally evaluates

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Icons and symbols on IV related products:

Global industry must reflect on the safety aspects

A patient with a low potassium level was due to receive three sequential, hour-long infusions of highly concentrated potassium chloride 20 mEq in minibags. A primary IV of 0.9% sodium chloride was infusing so the patient's nurse attached a secondary IV set to the first potassium chloride minibag, connected it to the primary line, and began infusing the solution via a pump. She came back to the patient's room when the second dose was due and noticed the potassium solution was flowing quickly into the drip chamber.

She then realized the solution was flowing into the primary IV bag rather than the patient. Upon examination, she noticed the primary bag's tubing had a 15 micron filter at the base of the drip chamber. This special tubing was to be used for albumin administration; it did not have a back-check valve, which allows fluid to flow in one direction only, to prevent

backup into the primary IV. Thus, the solution in the potassium bag (via tubing with a back-check valve) was backing up into the primary IV bag rather than infusing into the patient. Looking through the stock room, the nurse later found that pump tubing with a back-check valve and filtered tubing sets were mixed in a storage bin together. The labels on the two items are difficult to tell apart. While the tubing in this case was from Alaris, similar issues

exist with other IV manufacturers. The many symbols and icons that now appear on IV-related product labels (including IV sets and bag labels) may have played a role in this error because their "sameness" detracts from recognition of actual product identity. They invite inattentional blindness (<http://www.ismp.org/Newsletters/acutecare/articles/20090226.asp>), where the person performing the task (label reading in this case) fails to see what should have been plainly visible (the product identity).

The icons have resulted from standards development to assist the global pharmaceutical and device industries in communicating certain information without having to print separate labels in multiple

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Table 1. Examples of icons, symbols, and numbers/text on labels and their meaning.

| Icon/Symbol/Text | Intended Meaning |
|-----------------------------------------------------|---------------------------------|
| Number inside a drop | Drop size |
| Number under the drop between two squares | Priming volume |
| "REF" in a box | Catalog number |
| "Latex" in a circle with slash mark | Latex-free |
| "DEHP" in a circle with slash mark | DEHP-free |
| Syringe/needle and port in a circle with slash mark | Needle-less access port |
| Large bold capital "P" | Infusion pump tubing |
| Castle figure | Manufacturer |
| "EC" in a box next to "REP" in a box | Who to contact with a complaint |
| "LOT" in a box | Lot number |
| Hourglass (required in Europe) | Use by date |
| "Rx only" | Prescription only |
| Open book with lower case letter "i" | Consult instructions |
| "2" in a circle with slash mark | Single use |
| "CE" | Allows sale in Europe |
| "2" on a piece of paper with folder up corner | More text on reverse |
| 15 micron symbol in a circle | Filter size |



Figure 1. Set with check valve (L) is difficult to distinguish from set with 15 micron filter and no check valve (right). The meaning of various symbols on the label may not be understood, and their use, along with label information in various languages, increases label similarity.

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obstetrics outcomes, and identifies adverse-
event cases and systemic weaknesses.



Medication patch slips

into wrong pocket. In the process of withdrawing a patient’s nicotine patch from an automated dispensing cabinet, a carousel pocket opened to reveal two nicotine patches and one fentaNVL 50 mcg/hour patch. The nurse immediately called the pharmacy to report the discrepancy. Pharmacy investigated and found that it was not a dispensing error but that both patches (nicotine and fentaNVL) were stored in the same medication carousel and the fentaNVL patch “slipped” over the top of one pocket and into another pocket that contained nicotine patches. Generally, the carousel pockets are reserved for controlled substances, but there had been a history of pilferage of the nicotine patches when they were stored in matrix drawers. To deter pilferage, pharmacy had begun stocking them in secure carousel pockets with the tracking feature on to count the product. FentaNVL was in a nearby pocket by itself, but when the carousel turned, patches sticking up from the pocket were caught and dragged to another pocket which housed nicotine patches. The hospital has since moved the nicotine patches to a lidded container and kept the tracking feature on to deter diversion.



Volume control set safety.

Hospitals that still use **BURETROL** or **SOLUSET** volume control sets (VCS) should examine how they are being used to deliver IV medications in patient care units, including the emergency department. Of concern is the lack of identifying the drug placed in the VCS—particularly in an emergency—as well as the potential for chemical inactivation or precipitation that may occur in the VCS or IV tubing when multiple medications are administered using the same set. If VCS are used, ensure that staff label the chamber when medications are added, check incompatibilities with pharmacy before adding the drug, and maintain sterile technique.



Free medication safety

videos. The latest medication-related FDA *Patient Safety News* videos (created in cooperation with ISMP) are available for free viewing or downloading on the ISMP website (www.ismp.org/Tools/ continued on page 3 ▶

Purple is not an official standard for either enteral feeding equipment or PICC lines

An epileptic patient who was supposed to receive oral **KEPPRA** (levetiracetam) liquid via a PEG tube instead received it IV via a Bard PowerPICC (peripherally inserted central catheter) line. This catheter is indicated for short or long-term peripheral access to the central venous system for intravenous therapy, power injection of contrast media, central venous pressure monitoring, and blood sampling. An oral Baxa amber syringe that held the levetiracetam did not connect properly to the hub of the PICC line, however it could be held easily against the opening for the injection. The patient was closely monitored by his medical team and, fortunately, did not have a negative outcome.

It’s possible that the experienced nurse who incorrectly gave the drug IV was confused by a purple color system available from Covidien for enteral feeding equipment.

The color is identical to the purple coloring used for the patient’s Bard PowerPICC line (see Figure 1).

Purple is not an official standard color for either enteral products or PICC lines in the US, although it is the official color for enteral products in the United Kingdom. The concern is the identical color for both enteral and vascular lines, which may increase the risk of wrong connections. Even though the enteral connectors don’t easily fit into a vascular catheter’s Luer, it is possible that a determined individual will make it work, as happened here. Even more confusing is that some enteral products utilize orange as the color on some enteral feeding equipment and some PICC lines are also orange. Other manufacturers may also have purple PICC lines; likewise, other purple enteral products may become available.



Figure 1. (top) PowerPICC vascular catheters.

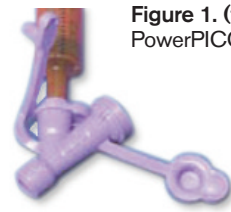


Figure 2. (left) Purple connector for enteral use.

Avoid using the same color for each type of access device. Also, adding a stronger auxiliary label—For Oral Use Only—might help. The syringe used in the error cited above has “oral use only” imprinted in small font that is easily missed. The syringe label from pharmacy also had small type stating, “oral use only,” but the nurse saw neither. The hospital is now getting special tamper-proof labels with “ORAL” in large case, which they plan to apply over the syringe cover so it’s visible to the nurse. They have also stepped up orientation efforts to brief nurses on the risk of error. It would be helpful if FDA stepped in to help standardize the colors for these products.

Label improvements continued from page 1

languages. However not many understand their meaning. For example, in Figure 1, does the latex symbol near the lower left of the label mean that the infusion set contains latex and should not be used with patients allergic to latex OR that it does not contain latex and is safe to use? Table 1 describes some of the icons and symbols and their intended meaning. (A complete set of approved icons – Document BS EN 980: 2008 – may be purchased at www.global.ihs.com.) If

these symbols are to be used, global regulators and industry need to facilitate label improvements. Efforts should center on increasing conspicuity of critical information on labels and reducing clutter that diverts attention. We have spoken with affected companies. Although the basic problem relates to manufacturer standards, we believe labels of IV sets and solutions could be improved now by manufacturers to make the most important information on the label stand out.

SafetyBriefs continued from page 2 (fdavideos.asp). Just a few of the videos are listed below, with many more available on our website!

| | |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| May 2009 | Safety Problems with Baxter Colleague Volumetric Infusion Pumps Don't Share Insulin Pens Between Patients |
| April 2009 | Preventing Overdoses when Using Methadone to Treat Chronic Pain Avoiding Medication Errors with Multiple Brand Names |
| March 2009 | Caution Using Topical Anesthetics Prior to Mammography Preventing Dosing Errors with Alteplase |
| February 2009 | New Labels for Non-prescription Cough and Cold Medications More Mix-ups between Propylthiouracil and Purinethol |

Special Announcements...

ISMP teleconference. Join us on **June 11** for our teleconference, **Patient Falls and Medication Use: Making the Safety Connection**. Our speakers will be discussing: 1) the link between certain classes of medications and the risk of patient falls, 2) pharmacist and nurse interventions that can proactively reduce these risks, and 3) outcomes in their organizations related to implementing these interventions. To register, please visit: www.ismp.org/educational/teleconferences.asp.

Practitioner in Residence Program. This comprehensive 1-week "rotation" held in September at ISMP's office in suburban Philadelphia is designed to assist healthcare professionals who hold medication/patient safety positions in their organization and want to rapidly advance their safety leadership skills. Participants will work closely with ISMP experts on an individual project while completing learning modules. For more information, visit: www.ismp.org/Consult/practitioner.asp.

True allergy or other symptom?

Most of us realize that documenting patient medication allergies without including the type of reaction could lead to unnecessarily withholding the medication to which the patient has actually experienced a non-life-threatening drug reaction, not allergy. Recently, a physician pointed out such a problem often seen when "codeine" is listed as an "allergy" on patient records. If these patients are asked about their "allergy" symptoms, many will state that the drug makes them drowsy or nauseated, which clearly is not an allergy. Sometimes the "allergy" can then mislead practitioners and cause modification of treatment decisions unnecessarily.

In one reported case, an elderly debilitated individual was admitted to the hospital for an elective hernia repair. The patient was very thin and cachectic and had been taking 1 g of carbamazepine daily for many years for a seizure disorder. In the patient's chart was a notation that he was "allergic" to codeine, when it really just made him sleepy. Because of this, the surgeon deviated from his usual postoperative oral analgesic and ordered **DARVOCET-N** (propoxyphene napsylate and acetaminophen), to be continued after discharge. The next day, the patient took one dose of Darvocet-N for pain but did not feel well. The following day, he was found dead in his home, which a coroner attributed to carbamazepine poisoning. The patient's carbamazepine level, which had always been maintained between 6 to 9 mcg/mL, was 22 mcg/mL postmortem, which was caused by a drug-drug interaction between propoxyphene and carbamazepine. Propoxyphene may decrease the metabolism of carbamazepine, thereby increasing the serum concentration of the drug.

Darvocet-N also carries a warning regarding use in elderly patients. The elderly may be particularly susceptible to central nervous system depressant and constipating effects of narcotics. Thus, the drug is not considered the analgesic of choice in the elderly patient when mild-to-moderate pain requires a

narcotic analgesic. Also, propoxyphene is one of the drugs on the Beers List (<http://archinte.ama-assn.org/cgi/content/full/163/22/2716>) of potentially inappropriate medications in the elderly, so it should be avoided, if possible.

We can't say for sure what the surgeon would have prescribed had the patient's chart reflected that codeine made him sleepy. However, the mischaracterization on the "allergy" clearly led the physician to prescribe a different medication than his usual postoperative analgesic, which led to an adverse drug event.

Health professionals should communicate the symptoms experienced by a patient with a problem drug. Details on a reaction to penicillin, for example, can help distinguish classic manifestations of serious allergies (e.g., anaphylaxis or swelling of tongue or throat) from a non-allergic reaction (e.g., gastrointestinal symptoms). Penicillin is the drug of choice for certain infections, so avoiding its use for easy-to-treat side effects would be inappropriate. We have seen computer systems in hospitals that require the name of the drug (or category) to be chosen from a pull-down list that is correlated with another pull-down list to document the related symptom. If this issue has not been a topic of discussion at your safety committee, it should be.

A consumer article on this topic is available at: www.consumermedsafety.org/alerts.asp?p=2009_3_AL58.

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