ISMP
Medication Safety Alert!
Community/Ambulatory Care Edition

Educating the Healthcare Community
About Safe Medication Practices

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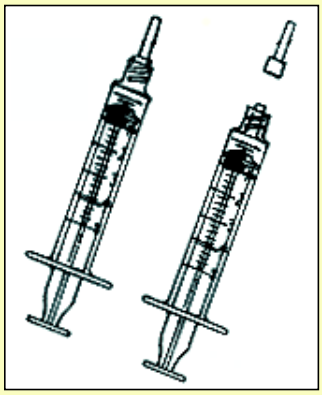
Dispensing Oral Liquids for Patients

For accuracy in measuring liquid medications, parents or caregivers should use specially designed oral syringes, available in pharmacies. However, in some cases, after seeing the patient, a doctor or nurse may give parents or caregivers a hypodermic syringe (without the needle) to assist in medication delivery. While either of these syringes will measure the medication and administer the right dose, it's very important to realize that hypodermic syringes are not meant for oral administration. The small, translucent tip caps may be ingested or aspirated, posing a potential choking hazard. In fact, medications actually can be drawn up into many hypodermic syringes without removing the caps. If not removed from the syringe before medication administration, the hypodermic syringe cap may pop off into a patient's mouth when the plunger is pressed to release the medication. (See diagrams)



A: Standard hypodermic syringe with plastic cap ejected on right.

B: Cap inadvertently ejected into patient's throat.

Source: Cohen MR. (ed). Medication administration problem solving in ambulatory care. 1994 American Pharmaceutical Association.

Unlike hypodermic syringes, oral syringes generally have caps that are colored and shaped for visibility. These caps are extremely difficult to dislodge by pressing on the plunger, yet they pull off conveniently for medication administration. For example, the oral tip cap for the **EXACTAMED ORAL DISPENSER** (Baxa) has a pin that inserts into the syringe tip to create a seal. When capping the syringe, a positive action is felt or heard to ensure that the cap is secured. When we tested Baxa syringes, we found that dislodging the cap of a syringe containing soapy water was practically impossible. However, not all syringes are this safe.

Over the past few years, there have been several reports where children have swallowed or choked on hypodermic syringe caps that were overlooked by parents and left on the syringes when

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Safety Briefs

■ At publishing time, we received a report of a pharmacist who misread a prescription for **ZYVOX** (linezolid) 600 mg as **ZOVIRAX** (acyclovir) 600 mg BID. Similar names and strengths likely contributed to this error.

■ While in a hospital, a bone marrow transplant patient weighing only 39 kg had been receiving phosphorus replenishment with 2 tablets TID of **K PHOS NEUTRAL** (8 mMol phosphorus, 1.1 mEq potassium and 13 mEq sodium). This supplied a total of approximately 6 mEq of potassium per day. Upon discharge, a prescription was written for **K PHOS NEUTRAL** packets, *2 packets TID*. However, K Phos Neutral is not available in packets. Instead of clarifying the order with the prescriber, the pharmacist substituted **NEUTRA PHOS K** packets, which contains the same 8 mMol of phosphorus but has 14.25 mEq of potassium! Evidently he was unaware of the large difference in potassium content between these two formulations. At 2 packets TID, the patient was taking an excessive amount of potassium (about 85 mEq per day). Not long thereafter, the patient was readmitted to the hospital with EKG abnormalities and a serum potassium of 6.4 mEq/L (normal = 3.5 – 5 mEq/L). To avoid confusion, phosphorus supplements should appear in computer systems as mMol of phosphorus and mEq of potassium and/or sodium. Alerts should be built into the system to warn of excessive doses and computer generated labels and the original prescription on file should list both mMol of phosphorous and mEq of potassium or sodium.

■ It's not what you say, it's the way you say it. A patient who was admitted to a hospital ICU for chest pain mentioned that her physician previously had given her a prescription for nitroglycerin tablets, but she never took them despite substernal pain. The patient said, "My pharmacist told me he hoped that I never have to take this medicine because it will probably give me a big headache." Not wanting to invite a headache, she threw the medicine away. Healthcare providers must carefully consider what is said, how it is said, and how the patient might react during medication counseling. Patients certainly should know what side effects to expect, but they also need to be armed with enough information to make informed decisions.

cont'd on page 3

Oral Liquids *(cont'd from previous page)*
administering the medication. In Australia, a near-fatal accident occurred in 1995. An infant's mother, unaware that the syringe was fitted with a protective cap, drew the first three doses into the syringe and administered the medication without a problem. On the fourth dose, the cap came off and lodged in the infant's throat, causing asphyxiation. After considerable effort, the cap was dislodged from the infant's throat. The presence of the syringe tip cap was not obvious because it was similar in color to the body of syringe.

Despite these reports, last year, a 5-month-old child asphyxiated when a cap from a Becton Dickinson 3 mL hypodermic syringe ejected into his throat during medication administration. In this case, a pediatrician provided the parents with the hypodermic syringe (without the needle) to administer **VANTIN** (cefpodoxime) suspension. With the cap intact, the father inserted the syringe into the Vantin, pulled back the plunger, and the medication flowed into the syringe. To him, the cap appeared to be part of the syringe. When he placed the syringe containing the medication into the baby's mouth, the cap flew off and became lodged in his airway. The baby was taken to the hospital where a procedure was performed to remove the cap; however, he did not survive.

Safe Practice Recommendations: When dispensing oral liquids in all settings, especially in the ambulatory care setting, pharmacists, physicians, and nurses should provide only specially designed "oral use only" syringes or another appropriate measuring device. Alert parents and caregivers to the potential for ingestion or asphyxiation of syringe tip caps. While we are not aware of a child (or elderly, disabled adult) who has ingested or aspirated an oral syringe tip cap, the potential exists. Since these syringes may be used for many doses, instruct parents/caregivers to remove the cap before administration and to store the recapped syringe in a childproof location. Proper removal and disposal of syringe tip caps before drug administration is essential to prevent accidental ingestion or asphyxiation by children. (Keep in mind that children may have access to a cap that was discarded in a trashcan.) In addition, proper counseling on how to use the oral syringe is necessary. Those caring for the patient receiving the oral liquid need to know how to accurately measure the dose and how to clean the oral syringe, if it is to be reused. When dispensing and administering oral liquid products in nursing homes and home care settings where injectable medications are administered, it is critical to use specially designed and labeled oral syringes that will not accept a needle or fit into parenteral injection ports. While many small bore feeding tubes have parenteral (Luer) fittings that only accept hypodermic syringes, others may have a small bore feeding tube that is compatible with Baxa and Becton Dickinson oral syringes.

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Hypodermic syringes should never be used for oral medication administration. Practitioners should tell parents and caregivers to use only measuring cups or oral syringes when giving liquid medications. Becton Dickinson recently told us that they plan to eliminate the syringe caps provided with their hypodermic syringes in an effort to reduce the likelihood of choking and asphyxiation in the event that one of their products inadvertently is used for measuring and administering an oral liquid product.

A Medication Error Trifecta!

PROBLEM: A confused, agitated, and combative patient was admitted to an ER with severe nausea, vomiting and a reported seizure. His initial diagnosis was "viral gastroenteritis." The patient had been taking **WELLBUTRIN** (bupropion) for depression. Six weeks prior to his admission he was seen by his physician, who gave him new prescriptions for all his medications. But this time, he prescribed them using generic names. Unfortunately, the patient continued taking his original prescription for Wellbutrin along with the new prescription for generic bupropion. Around the same time, he attended a smoking cessation program where he was referred to another physician who gave him a prescription for **ZYBAN** (bupropion). Thus, he began taking Zyban, bupropion, and Wellbutrin - all at the same time. The patient had given the physician who prescribed Zyban a list of his other medications. All three medicines were listed as "active meds" in the physician's notes with no apparent recognition of the triplication. The ER staff, unit nurses, pharmacists, the attending physician, and a consultant neurologist also missed the error. A 3rd-year medical student found the error after looking up the generic names of all the patient's medicines. If the student had not found the error, the reporter believes that the patient would have been sent home on the same triplicate therapy, totaling 600 mg daily. Fortunately, the problem was identified and the patient was discharged from the hospital after 24 hours of intravenous hydration.

Some pharmaceutical companies select different brand names for products with the same active ingredient when it is FDA-approved for different indications. In addition to Zyban and Wellbutrin, other examples include **PROPECIA** and **PROSCAR** (both finasteride), and **SARAFEM** and **PROZAC** (both fluoxetine). Marketing concerns may drive the practice of assigning a new trademark when the same active ingredient is used for a different indication, but other issues also may be involved. For example, FDA allowed Lilly to use Sarafem for premenstrual dysphoric disorder because Prozac (approved for depression, obsessive-compulsive disorder and bulimia) may have a stigma associated with its use and women may not want to use it under that name. Also, third party reimbursement may be available only for certain approved indications (e.g., bupropion therapy may be covered for depression [Wellbutrin] but not for smoking cessation [Zyban]).

SAFE PRACTICE RECOMMENDATIONS: Multiple names for products increase the likelihood of duplicate or triplicate therapy. Duplicate therapy also may occur when branded generic products are available from different manufacturers; when the same

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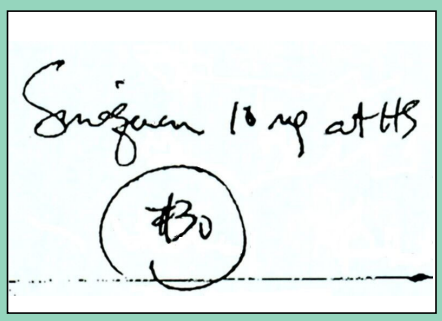
Safety Briefs *(cont'd from page 1)*

■ One of the most common medication errors occurs when two drug names that look similar are confused. Human factors experts tell us that "confirmation bias," something we all experience from time to time, plays a role. Confirmation bias means that you are more likely to believe information that supports your view rather than information that does not. Another way of putting it is that you are more likely to see what you are most familiar with, not what's really there. After reading the September issue of this newsletter, a pharmacist sent us a good example of confirmation bias as it applies to drug name confusion. A prescription written for "SINEQUAN" (doxepin) was misread in his pharmacy as "SINGULAIR" (montelukast). In this pharmacy, staff rarely saw Sinequan prescriptions written using the brand name. Since the drug has long been available generically, "doxepin" has been the name most often used by prescribers. On the other hand, prescriptions for "Singulair" are seen commonly. Prescribers rarely use "montelukast" when prescribing. As the actual handwritten prescription shows, the two drug names (Sinequan and Singulair) can look similar. "Confirmation bias" led staff to see the name that was most familiar to them – Singulair – rather than what was actually being communicated – Sinequan. The fact that these drugs are both given orally, often in the same 10 mg strength at a similar dosing interval, adds to the potential for confusion. Since pharmacists preparing a medication may not be able to recognize that they have selected the wrong drug, blaming them for the error is fruitless. Instead, focus on ways of improving the system. Place reminders on containers or in your computer system to alert staff about look-alike drug names. Improve checking accuracy by having another pharmacy staff member view completed prescriptions. During counseling, ask the patient what they are taking the medication for. Encourage prescribers to write the indication for each prescription to further help distinguish between look-alike product names.



Confirmation bias lead a pharmacist to see "Singulair" instead of "Sinequan".

■ CAUTION: Don't confuse **LUPRON DEPOT-PED** (leuprolide acetate) with **LUPRON DEPOT-3 MONTH.**

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Trifecta *(cont'd from previous page)*

drug is dispensed from two pharmacies under two different names; or when one physician prescribes the product by its brand name and another by its generic name (e.g., **COUMADIN** and warfarin). Fragmented healthcare adds to the problem. Healthcare practitioners should get a complete medication history from each patient to ensure safety. Alert patients to this problem and teach them the generic and brand name of products when applicable. Encourage patients to carry an up-to-date medication list and share it with their healthcare practitioners whenever they seek care. Tell them to have their prescriptions dispensed from the same pharmacy if possible.

Share Your Stories with Us

Articles in this publication are based on actual reports from practitioners. We'd like to hear from you too! Please share reports of medication errors and prevention recommendations in confidence with colleagues in the US and worldwide. Errors may be reported on the ISMP (**www.ismp.org**) or USP (**www.usp.org**) web sites or communicated directly to ISMP by calling **1-800-FAIL SAFE (324 5723)** or through e-mail at **ismpinfo@ismp.org**. Reports are forwarded automatically to the FDA and pharmaceutical companies whose products are mentioned in reports. Reporter identity and location is strictly confidential and never published. Be sure to visit our web site for additional information.

Safety Briefs *(cont'd from previous page)*

Lupron Depot-Ped 11.25 mg is a one-month duration gonadotropin-releasing hormone analog used in the treatment of central precocious puberty in pediatric patients. Unfortunately, it shares the same 11.25 mg strength as Lupron Depot-3 Month, which is administered every three months in women with endometriosis or uterine leiomyomata (fibroids). Both products are available in a kit with a pre-filled, dual-chamber syringe. Recently we heard about errors involving multiple pediatric patients receiving the adult product. On several occasions, the hospital-based outpatient pharmacy dispensed Lupron Depot-3 Month 11.25 mg in place of Lupron Depot-Ped. On these occasions, pharmacy staff selected the wrong computer code during order entry and then, when referencing the patient drug profile for monthly refills, continued to select the 3-month dosage form instead of the monthly pediatric dosage form. Thus, one computer selection error precipitated a series of errors. Although the product labels use a picture of either an adult or child to help distinguish the different dosage forms, a price sticker was placed over the picture, obscuring the visual clue. The drugs were taken to pediatrician offices where, in every case, nurses administering the drug also failed to catch the error. In all, errors reached 5 different patients for up to 4 months. The 3-month adult dosage form resulted in absorption of the child's dose over three months rather than one month. The facility is still evaluating patients, some of whom were prematurely considered treatment failures. The error was discovered when parents of one of the children called the pharmacy to ask about the increased prescription costs compared to prior months (Lupron Depot-3 Month costs more than the pediatric depot product). To prevent future errors, storage shelves were labeled to warn about dosage form mix-ups. Also, computerized warning messages now are visible when either dosage form is selected. Prescribers were informed of the error and preprinted prescription blanks that clearly differentiate the products are now being considered. To be sure that important label information is not obliterated, use care when placing price stickers and other labels on a manufacturer's container.

Lupron product labels contain important visual clues regarding the intended patients.

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