

ISMP Medication Safety Alert!®

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Safety Briefs

SSRI or SSKI? Depending on context, the abbreviation "SSRI" might be interpreted as either "sliding scale regular insulin" or "selective serotonin reuptake inhibitor." For instance, in our November 27, 2003 issue, we wrote about a case where, without context of the full order to understand that it related to a sliding scale of regular insulin, a pharmacist thought a physician wanted to discontinue the patient's selective serotonin reuptake inhibitor. Thus, **ZOLOFT** (sertraline) was discontinued and the patient missed several doses in error. Be aware that "SSKI" (saturated solution of potassium iodide) can also be confused with "SSRI." Recently, a patient who was receiving potassium iodide, potassium chloride, and regular insulin per a sliding scale had an order written to "hold dose of SSKI and

hold ~~the~~ dose of SSKI and potassium chloride today

Should the sliding scale of regular insulin (SSRI) or potassium iodide (SSKI) be held?

potassium chloride." At first the pharmacist thought the physician wanted to discontinue the potassium chloride and the sliding scale of regular insulin, as she misread "SSKI" as "SSRI." It turned out the physician had intended to discontinue both the potassium iodide (abbreviated as SSKI) and potassium chloride. SSKI and SSRI should not be used in orders, but if they are encountered, they should be clarified to prevent misinterpretation.



Seasonal mix-ups. In reviewing medication errors in accessible databases, it's clear that mix-ups between Pfizer's antihistamine **ZYRTEC** (cetirizine) and Eli Lilly's antipsychotic **ZYPREXA** (olanzapine) seem to spike in the winter months. No doubt this is related to an increase in prescribing Zyrtec during peaks in the flu and cold season. We have noticed a similar spike during the spring allergy season. These errors are potentially serious. Patients who receive Zyprexa in error

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High-Alert Medication Feature: Anticoagulant safety takes center stage in 2007

At the start of each year, ISMP has often encouraged organizations to select and follow a New Year's resolution related to medication safety. This year we, too, have made a New Year's resolution: To highlight for our readers key information about selected high-alert medications and how to reduce patient harm when prescribing, dispensing, and administering these drugs. To best accomplish this, we will be publishing regularly appearing "high-alert medication" features and safety briefs to bring heightened national attention to the problems and suggested safety improvements with these medications.

High-alert medications are an essential component of drug therapy, but they carry a significant risk of causing serious injuries or death to patients if they are misused. Errors with these products are not necessarily more common but the consequences are clearly more devastating. ISMP published its first list of "high-alert" medications in 1989 (Davis NM, Cohen MR. Today's poisons: how to keep them from killing your patients. *Nursing* 89; January 1989:49-51). Today, ISMP's most up-to-date high-alert medication list (www.ismp.org/Tools/high-alertmedications.pdf) is based upon an extensive review of errors submitted voluntarily to the USP-ISMP Medication Errors Reporting Program as well as a broad review of clinical and safety literature, input from our clinical advisory board and US safety experts, and surveys in our newsletters.

We start this year's "high-alert medication" feature with anticoagulants—unfractionated heparin, low-molecular

weight heparin, and warfarin. When used or omitted in error, anticoagulants can cause life-threatening or fatal bleeding or thrombosis. These drugs are among those that will be receiving targeted attention during the coming year from the Joint Commission, which has posted for comments a proposed 2008 National Patient Safety Goal associated with anticoagulation therapy (www.jointcommission.org/NR/rdonlyres/47F81056-2F85-494F-978A-7CB0908D0DB4/0/08_potential_HAP_NPS_G.pdf), and from the Institute for Healthcare Improvement (IHI), which has targeted anticoagulants and several other high-alert drugs for improvement in its recently launched 5 Million Lives Campaign (www.ihl.org/IHI/Programs/Campaign/). Common risks we have identified with these medications are provided in a bulleted list on page 2, and our suggested safety improvements are presented in a checklist format on page 3.

In addition to the risks and suggestions for improvement on pages 2 and 3, ISMP highly recommends conducting an interdisciplinary failure mode and effects analysis (FMEA) within your facility to identify organization-specific sources of failure with the use of anticoagulants, and to individualize the key improvements needed to reduce the risk of harmful errors with these medications. To assist you, ISMP has created a sample FMEA, which can be found at: www.ismp.org/Tools/FMEAofAnticoagulants.pdf. In the sample FMEA, the severity score for each failure mode has been included. Since the probability of each failure and its ability to be detected before causing patient harm will vary from organization to organization, the probability and detectability scores have been omitted so that each facility can make its own assessment of these vulnerabilities.


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SafetyBriefs continued

have reported dizziness, sometimes leading to fall-related injuries, and patients on Zyprexa for a behavioral health illness have relapsed when given Zyrtec in error. Therefore, we recommend that you take time this month to notify nurses, medical staff (especially internists, family practitioners, psychiatrists, and allergists), and pharmacists about the risk of mix-ups when either drug is prescribed. Including the purpose of the drug on prescriptions would help avoid mix-ups, as would storing the containers of these products apart from one another and adding reminders on containers and computer screens about the potential for error. Additional recommendations for preventing drug name mix-ups can be found as part of the Joint Commission's National Patient Safety Goal 3C (www.jointcommission.org/NR/rdonlyres/C92AAB3F-A9BD-431C-8628-11DD2D1D53CC/0/LASA.pdf).

NewsUpdate

 **Tragedy brings a measure of good.** Julie Thao, the Wisconsin nurse who was facing criminal charges in the tragic medication error-related death of a young mother, Jasmine, entered a “no contest” plea in court in December to two misdemeanor counts of illegally administering prescription medications, after which the state dropped the felony count—a more serious charge that could have led to jail time. More than three dozen nursing colleagues were on hand to support Julie, who repeatedly broke down and expressed deep anguish and remorse about the error. One day before her court appearance, the Wisconsin Department of Regulation and Licensing suspended her license for 9 months, retroactive to July 2006. The Department considers the suspension relatively short, as the members were influenced by Julie's positive work performance reviews for the past 13 years. Julie's working hours were limited to no more than 12 hours per 24-hour period or 60 hours per week for 2 years (although there are no work hour limitations for other nurses in the state, or for Julie after 2 years). The state court placed Julie on probation for 3 years, during which time she is banned from working in critical care settings, including birthing units. The licensing department is also requiring Julie to take classes on preventing medication errors and to make presentations about what she learns to help others avoid medication errors. This last requirement is certainly no burden to Julie. As with many other healthcare professionals who have been involved

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Common Risks Associated with Anticoagulants

(heparin, low-molecular weight heparin, warfarin)

Duplicate or concurrent therapy ▼

- Unrecognized concomitant use of anticoagulants, particularly unfractionated heparin prescribed upon admission and low-molecular weight heparin prescribed initially in the emergency department or other outpatient area and continued upon admission.

- Patient confusion about generic and brand names of warfarin, leading to self-administration of both warfarin and Coumadin.

Accidental stoppage of therapy ▼

- Forgetting to resume an anticoagulant after holding a dose(s); forgetting to resume an anticoagulant upon discharge.

Look-alike vials or syringes ▼

- Mix-ups among various concentrations of heparin packaged in vials or bags; mix-ups between heparin vials and other look-alike vials (e.g., insulin, saline); mix-ups between heparin flush syringes and other look-alike syringes (e.g., saline flush, low-molecular weight heparin).

- Confusion between look-alike bags of IV heparin, lidocaine, and Hespan (hetastarch).

Look-alike names ▼

- Handwritten orders for Avandia (rosiglitazone maleate) misread as Coumadin, and vice versa.

Dosing errors ▼

- Administering the wrong dose because the barrel of Lovenox (enoxaparin) prefilled syringes lacks sufficient milliliter gradations.

- Patient self-administration errors due to confusion if required to take different warfarin doses on alternate days or if frequent dose adjustments are required, especially if the dose differs from the label on the prescription bottle.

- Incorrect dosing when resuming warfarin after reversing its effects, failing to recognize that phytonadione continues to block the effects of warfarin for about a week.

- Failure to reduce the standard starting dose of warfarin for elderly patients.

- Failure to consider renal function when dosing low-molecular weight heparin.

- Abbreviating units as “U,” resulting in 10-fold overdoses.

- Infusion pump setting errors with IV heparin involving the concentration or rate of infusion, or forgetting to reset the pump after delivering a bolus dose from the continuous infusion bag.

- Mix-ups between kilograms and pounds, or not using a current measured weight when calculating doses.

- IV heparin admixture errors if a standard, premixed solution is not in use.

Calculation errors ▼

- Mathematical errors in determining the volume of heparin to administer.

- Miscalculation of the volume of heparin to be added to TPN or other electrolyte solutions.

Monitoring problems ▼

- Failure to obtain baseline lab tests and/or verify the most recent lab values before prescribing and administering an anticoagulant.

- Adjusting warfarin doses too often without assessing overall trends in INR values (leading to labile anticoagulation levels).

- Erroneous INR/aPTT results (from changes in equipment reagents, incorrect amount/concentration of sodium citrate in blood collection tubes, overfilling the tube with blood).

- Patient failure to comply with outpatient testing.

Drug and food interactions ▼

- Lack of effective electronic alerts for clinically significant drug, herbal, and food interactions with warfarin.

Spinal hematoma ▼

- When used concurrently with spinal puncture, increased risk of epidural or spinal hematoma (potentially leading to paralysis or other injury).

Adverse drug reactions ▼

- Failure to detect and quickly treat heparin-induced thrombocytopenia.

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**News Update** continued

in a harmful error, Julie has a profound desire to do as much as possible to help prevent similar tragedies. To facilitate this desire, the Chairman of TMIT (Texas Medical Institute of Technology), Charles Denham, MD, has most generously offered Julie a yearlong paid fellowship to join his team as they work with patient safety leaders in the US to further the adoption of best safety practices. As part of the fellowship, Julie will also

be able to spend time at ISMP, learning about medication safety and working with our staff to reduce the risk of medication errors nationwide. Along with Julie, our deepest sympathies go out to Jasmine's family. In court, Jasmine's mother noted that she sincerely hopes her child's death will not be in vain. Perhaps the healing can now begin in earnest for both Julie and Jasmine's family as a measure of good comes from this terrible tragedy.

Special Announcements...

ISMP teleconference. Please join us for our first teleconference of 2007, *Gaining Physician Compliance to your Patient Safety Initiatives*, to be held on **February 22, 2007**, from 1:30-3:00 p.m. EST. ISMP Medical Director and trustee **Russell Jenkins, MD**, will explore how to win, not just enforce, physician compliance to organizational safety goals, the traits necessary for physician safety champions—clinical credibility, communication skills, and a positive and contagious attitude, for example—and how champions can break down the barriers to physician engagement. Visit www.ismp.org/educational/teleconferences.asp to register.

Space filling up fast! Registration for Series I of the **ISMP Rural Hospital Medication Safety Connection** is full, but we are still accepting registrations for Series II (a repeat of Series I), which begins on **February 6, 2007**. This collaborative, uniquely tailored to rural hospitals, offers a comprehensive tool set, live interaction with ISMP experts via audio-conferences, and more! Visit www.ismp.org/Consult/ruralhospital/default.asp to register.

Joint Commission field review. Proposed revisions to Medication Management Standards MM 4.10 and 8.10 have been posted for field review until **January 24** (www.jointcommission.org/AccreditationPrograms/Hospitals/Standards/FieldReview/mm_stds_fr.htm). The revisions are in response to concerns expressed by emergency department (ED) and radiology practitioners about timely care, management of urgent situations, and efficient deployment of manpower when requiring a pharmacist to review medication orders prior to administration in these settings. Among other things, the revisions would permit the determination of non-urgent ED drugs that can be administered and the reviewed by a pharmacist retrospectively as soon as possible.

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Recommended Safety Improvements for Anticoagulants

(Key: H=heparin, LMWH=low-molecular weight heparin, W=warfarin)

Standardization ▾

- ▣ Develop and implement interdisciplinary treatment and monitoring guidelines. (H, LMWH, W)
- ▣ Use a standard weight-based heparin protocol for each indicated use of a heparin infusion. (H)
- ▣ Use standard order sets or preprinted orders. (H, LMWH, W)
- ▣ Do not abbreviate units as “U” on handwritten, typed, or computerized materials. (H, LMWH)
- ▣ Standardize the concentration of therapeutic heparin infusion; require pharmacy to prepare and dispense any approved use of a non-standard concentration. (H)
- ▣ Administer warfarin at a standard time that allows for thorough review of daily laboratory results and necessary dose adjustments before administration. (W)
- ▣ Establish and follow a strategy for handling “hold” orders. (H, LMWH, W)
- ▣ Establish protocols for standard (before planned procedure) and rapid (emergency) reversal of anticoagulation. (H, LMWH, W)

Simplification ▾

- ▣ Administer bolus doses from a pharmacy-prepared syringe (unless a smart pump is used and can alert the nurse to resume the maintenance infusion rate after the bolus dose has been administered from the bag). (H)
- ▣ Dispense warfarin in exact patient doses (e.g., 2 mg, 4 mg, 5 mg). (W)
- ▣ Dispense heparin flush solutions from the pharmacy in the exact concentration required for the patient population (e.g., neonates) and/or parenteral access device in use. (H)
- ▣ Provide single use or unit-dose packages to patient care units. (H, LMWH, W)

Externalize error-prone processes ▾

- ▣ Use commercially prepared, premixed IV heparin solutions for infusion. (H)
- ▣ Use commercially prepared, unit-dose syringes (including adult heparin flushes when saline flushes will not suffice). (H, LMWH)

Improved access to information ▾

- ▣ Employ smart pumps, bar coding, and computerized prescriber order entry. (H, LMWH, W)
- ▣ Use the patient’s actual weight in kilograms (or ideal body weight if indicated) to determine heparin doses. (H, LMWH when indicated)
- ▣ Affix infusion rate charts (preprinted on labels) to heparin infusion bags. (H)
- ▣ Improve access to prior/current drug therapy by sending all emergency department and cardiac catheterization orders to the pharmacy if

- patients are admitted to the hospital. (H, LMWH, W)
- ▣ Use anticoagulation flow sheets designed for use during the inpatient stay, and provide them to patients/transfer facility upon discharge. (H, W)
- ▣ Teach patients self-monitoring and administration of prescribed anticoagulants. (H, LMWH, W)

Differentiation or constraints ▾

- ▣ Safely select, procure, and store anticoagulants away from other drugs with look-alike names or packaging. (H, LMWH, W)
- ▣ Require pharmacy to dispense all inpatient anticoagulants or verify all orders for therapeutic use of anticoagulants before removal from automated dispensing cabinets. (H, LMWH, W)
- ▣ Restrict access to multiple concentrations of heparin (in vials and/or syringes) in both the pharmacy and on patient care units. (H, LMWH)
- ▣ When unit stock of heparin is appropriate, provide the smallest size packages (unit-dose syringes, single-use vials) and the fewest doses necessary to meet the needs of patients between each restocking period.

(H, LMWH)

- ▣ Eliminate heparin flushes for peripheral venous access catheters; use saline flushes only. (H)

Reminders ▾

- ▣ Maintain functional drug interaction alerts for anticoagulants in computer order entry systems. (H, LMWH, W)

Redundancies ▾

- ▣ Employ strategically placed independent double checks (e.g., a pharmacist checks stock medications for units/dispensing cabinets before leaving the pharmacy; a second nurse checks the drug, line attachment, and pump settings before IV heparin is administered). (H)

Patient monitoring ▾

- ▣ Obtain baseline laboratory tests (e.g., hemoglobin, hematocrit, serum creatinine, platelet count, INR, aPTT) before prescribing anticoagulants. (H, LMWH, W)
- ▣ Make coagulation lab test results available in 2 hours or less. (H, LMWH, W)
- ▣ Use a protocol and/or preprinted orders for evaluation and treatment of heparin-induced thrombocytopenia. (H, LMWH)
- ▣ Establish inpatient pharmacy anticoagulation services and outpatient warfarin services for dosing, monitoring, and teaching patients about their therapy. (H, LMWH, W)
- ▣ Use process control charts to display trends in INR values and to assist with dosing. (W)

