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USP Patient Safety
CAPSLink™

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USP Patient Safety CAPSLink™

This message has been sent to you as a service of the U.S. Pharmacopeia, Center for the Advancement of Patient Safety (CAPS). USP is a not-for-profit, non-governmental organization that promotes the public health by establishing state-of-the-art standards to ensure the quality of medicines and other health care technologies. CAPS is a component of USP's Patient Safety public health program. The USP Center for the Advancement of Patient Safety was created to encourage medication error reporting, conduct data analysis and research, develop educational programs, and propose standards, recommendations, and guidelines that ultimately improve the safety and quality of patient care.

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Error Findings Related to JCAHO's National Patient Safety Goals

The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) began a more intensified focus on patient safety in 1995 that led to the launch of its Sentinel Event Program in 1996. The enhanced scrutiny of occurrences of serious adverse events (i.e., "sentinel events") led to the accumulation of critical information about their etiology. JCAHO believed that this information could then be used to provide guidance that would help healthcare organizations decrease the incidence and severity of adverse events. In 2002, JCAHO formed the *Sentinel Event Alert Advisory Group* (a panel of national safety experts) to help develop the first set of National Patient Safety Goals (NPSGs) which were put into effect on January 1, 2003.

NPSGs and their accompanying requirements represent specific actions that JCAHO-accredited organizations are expected to take in order to prevent medical errors such as miscommunication among caregivers, unsafe use of infusion pumps, and medication mix-ups. This issue of CAPSLink™ will examine error data findings reported to USP's MEDMARX® program in relation to several of the 2005 NPSGs.

2005 JCAHO National Patient Safety Goals Relevant to Medication Safety

- Goal 1.** Improve the accuracy of patient identification
- Goal 2.** Improve the effectiveness of communication among caregivers
- Goal 3.** Improve the safety of using medications
- Goal 5.** Improve the safety of using infusion pumps
- Goal 8.** Accurately and completely reconcile medications across the continuum of care.

Error Findings Related to Goal 1.

During the three-year period of 2001-2003, there were 532,144 error records submitted to MEDMARX. Approximately 4.4% of these (n= 23,689) cited *Wrong patient* as a **Type of Error**. Nearly 50% of *Wrong patient* errors did reach the patient but did not result in harm (Categories C and D) (Table 1.) Although only 1.3% of all *Wrong patient* errors resulted in harm, there were 10 sentinel events (including 3 fatalities) associated with this **Type of Error**.

Table 1. Error Category for *Wrong Patient* Errors

Error Category Index	%
Potential error Category A (n=2,631)	11.1
Error, no harm Category B (n=8,971) Categories C-D (n=20,759)	87.6
Error, harm Categories E-I (n=299)	1.3

Wrong patient errors did not just occur during drug administration, but were seen in every phase of the medication use process (MUP) (Table 2). Both transcribing

and dispensing phases had nearly an equal number of this error type. This suggests that mistakes in transcribing orders on the wrong patient's chart or on the order form are frequently perpetuated in the dispensing phase - perhaps because they are harder to detect.

Table 2. *Wrong Patient* Error Occurrence by Phase of the MUP

MUP Phase	n	%
Prescribing	1,740	8.3
Transcribing	5,817	27.6
Dispensing	5,553	26.3
Administering	7,881	37.4
Monitoring	86	0.4
TOTAL	21,057	

The three most frequently reported **Causes of Error** were *Performance deficit* (52.3%), *Procedure/protocol not followed* (30.5%), and *Computer entry* (16%) (Table 3).

Table 3. Causes of Error Associated with *Wrong Patient* Errors

Cause of Error	n	%
Performance deficit	11,653	52.3
Procedure/protocol not followed	6,804	30.5
Computer entry (Incorrect or incomplete)	3,538	15.9
Documentation (Inaccurate or incomplete)	2,547	11.4
Transcription inaccurate/omitted	1,927	8.6

Error Findings Related to Goal 2.

Communication among caregivers occurs primarily through written/electronic documentation or verbally (telephone or person-to-person). Breakdowns in communication occur with each. When combining several different communication variables together, this grouping of "communication selections" became the third most frequent **Cause of Error** reported to MEDMARX during 2001-2003 (Table 4).

Table 4. "Communication Selections" as a Cause of Error

Cause of Error	Count	%		
Performance deficit	180,317	37.5		
Procedure/protocol not followed	83,684	17.4		
Communication selections	73,856	15.4	Communication selections	Count
Transcription inaccurate/omitted	63,759	13.3	Communication	41,825
Computer entry	55,703	11.6	Look alike /Sound alike drug names	12,552
Documentation	54,352	11.3	Abbreviations	11,102
Knowledge deficit	51,009	10.6	Verbal order	7,899

Error Findings Related to Goal 3.

Many of the most frequently reported drug products involved in harmful errors are given IV and can be prepared in various concentrations. They are sometimes involved in mix-ups due to look-alike/sound-alike problems. Insulin, morphine, and heparin were the three most commonly reported problematic drug products (Table 5).

Table 5. Most Commonly Reported Drug Products Causing Harm

Product *	n	%
Insulin†	793	8.6
Morphine†	508	5.5
Heparin †	414	4.5
Warfarin†	275	3.0
Potassium Chloride†	245	2.7
Hydromorphone†	218	2.4
Fentanyl†	215	2.3
Vancomycin	172	1.9
Furosemide	159	1.7

* Includes all dosage forms and formulations

† High-alert medication

Percentages based on 9,214 selections

Error Findings Related to Goal 5.

During the 2001-2003 time frame, 4,917 records cited errors involving infusion pumps. Over 90% recorded that these errors originated in the **Administering Node**. Eight percent (n = 395) of these errors were harmful including 10 sentinel events. For data collected through MEDMARX, infusion pump errors involve two **Causes of Error** - Pump failure/malfunction and Improper Use of the Pump. A drilldown on these two **Causes** revealed the following:

- Pump failure/malfunction - - 21.4% (1,053 records) with 6.5% (68 records) resulting in harm
- Improper Use of Pump - - 83% (4,081 records) with 8.5% (343 records) resulting in harm

Error Findings Related to Goal 8. (Note: Data related to this Goal was not a component of the MEDMARX program during 2001 - 2003).

Recommendations to Improve Medication Safety Related to the NPSGs

Patient Identification

(The following items represent an abbreviated list previously presented in the January, 2004 issue of CAPSLink available at <http://www.usp.org/patientSafety/briefsArticlesReports/capsLink/>)

1. Conduct a review of the processes used in the admission of the patient into the facility. What patient-specific identifiers are collected and placed on the patient's wrist band, addressograph card, or computer record? Are there select identifiers that nurses, pharmacists, and physicians find easier to use (e.g., date of birth, Social Security number or hospital admission number)? Such a review could be performed by a sub-committee of a larger patient or medication-safety committee or even the Pharmacy & Therapeutics Committee.
2. Examine the admission/discharge/transfer (ADT) information system. What precautions or safeguards are in place to prevent patient mix-ups (e.g., patient's with the same last name residing in the same room or within the same patient care unit)? How quickly is ADT information updated?
3. All employees who assume any level of responsibility for patient care (e.g., transportation) or who administer care (non-invasive, or invasive care including transfusions and medication administration) to a patient should first verify that an ID band is attached to that patient and to verify that information on the ID band matches in every respect documented orders and/or labeled materials (e.g., medications or blood products) intended for use with that patient. Documentation may be the medical chart or medical chart surrogate.
4. Write out (i.e., print) the complete name of the patient – Last name, First name, and Middle Initial - on all manual records or charts. Information system records should incorporate Human Factors research into the design of how patient names appear on the computer screen (e.g., alternate shading of lines to differentiate a list of names) and to help identify the types of alerts that should appear (e.g., when two patients with the same last name are located on the same patient care unit).
5. Establish at least two different patient identifiers that will be used prior to

medication administration. Some identifiers that could be used include the individual's name, an assigned hospital ID number, social security number, date of birth, or telephone number. JCAHO requires that the two patient-specific identifiers must be directly associated with the individual and the same two identifiers must be directly associated with the medication (e.g., on an attached label to a medication container). The two identifiers may be in the same location (e.g. the patient's wrist band).

6. Encourage patients to state their name (when possible) before taking any medications and to always offer their wrist/ID bracelet for proper identification. Also encourage patients to ask the health care practitioner to identify each medication by name (including IV infusions or piggybacks) before it is administered. In situations where the patient is unable to state his/her name or ask questions about administered medications, encourage family members or caregivers to assume this role.

Communication

- 1) Create a policy that: (a) encompasses all areas (e.g., nursing unit areas, lab, pharmacy, and radiology) that report and/or receive verbal orders for medications, procedures, or critical test values; (b) establishes processes for receiving, transcribing, and authenticating verbal orders; (c) requires that the caller read the information (e.g., critical test results) to a qualified staff person trained to receive such information; (d) requires the person receiving the message to read back what was said, ask for clarification as to what was heard then document the results. Documentation should include the date and time of occurrence, a line to the effect "*critical results read back to...*(name of reporting party [e.g., lab technician])" and that the results/medication order/procedure was confirmed.
- 2) To the extent possible, urge prescribers to submit orders electronically and avert the need for additional handwritten transcription. When electronic prescribing is unavailable, the facility should establish policies that define: (a) the required elements that must be present in each medication order (including the drugs indication or intended purpose); (b) use of generic versus brand names; (c) precautions when ordering drugs with look-alike or sound-alike names; (d) appropriate use of abbreviations and (e) use of verbal and telephone orders.
- 3) The Institute for Healthcare Improvement (IHI) offers a technique - SBAR (Situation-Background-Assessment-Recommendation) that provides a framework for communication between members of the health care team. [Click here to read more.](#)

Safety of Using Medications

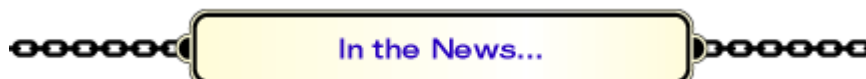
- 1) Create a list of high-risk/high-alert drugs and develop special procedures for ordering, transcribing, preparing, dispensing, administering and monitoring these products Do not allow blanket reinstatement of medication orders (e.g., "resume all pre-op meds").

- 2) Insulin continues to be the most frequently reported product involved in both errors overall and in harmful errors. Patients receiving insulin should be examined for the following risk factors that can lead to hypoglycemia: (a) being placed on “nothing by mouth” or NPO status; (b) temporarily or permanently holding or reducing the tube feeding or TPN; (c) when a patient fails to eat. Develop preprinted orders that are appropriate for when the patient is eating, orders for when a patient is NPO, and special IV insulin infusion orders.
- 3) Reconcile on a daily basis the pharmacy patient profile and the medication administration record (MAR) for patients receiving one or more designated “high-risk/high-alert” drugs. To categorize high-risk products, some health care facilities use the acronym “PINCH” or “PPINCH” meaning:
P = Pressors / Patient Controlled Analgesia (PCA) / Potassium challenges
I = Insulin / insulin drips
N = Narcotics (usually including patient controlled analgesia),
C = Chemotherapy
H = Heparin
- 4) Establish a double-check procedure for all IV solutions when: (a) the initial IV bag is hung; (b) the IV rate is changed; (c) a replacement bag or new bag is hung; and (d) the patient is transferred to another care unit or area.
- 5) Add alerts to the pharmacy computer system and to dispensing activities (e.g., brightly colored labels, TALL-MAN lettering, physical separation) to deal with sound-alike, look-alike drug products. Separate such products in all non-pharmacy areas. One of the Joint Commission's proposed 2005 National Patient Safety Goals explicitly requires accredited organizations to identify a list of look-alike/sound-alike drug pairs used in the organization and take appropriate preventative actions to minimize errors involving these same pairs. USP's *Quality Review* newsletter (#79) can serve as a resource for organizations in meeting this Joint Commission Goal. This newsletter includes reports submitted to both USP's error reporting programs from their inception through December 31, 2002. (See <http://www.usp.org/pdf/patientSafety/qv792004-04-01.pdf>)
- 6) Examine new technology that can assist with look-alike storage problems (e.g., carousel technology for pharmacy inventory and storage). Certain types of technology have been used in pharmacy for over a decade and are now available from companies like AutoPharm[®], Omnicell[®], McKesson[®], and Pyxis[®]. The carousel method finds/retrieves drugs by location ID and not by name. When the carousel is loaded, the “fast movers” are placed on one or two shelves, by velocity of use. Names on the shelves do not matter and look-alike drugs are stored away from each other. When fulfilling orders, the carousel spins and the pharmacy technician is directed by light to a bin location where the medicine is store.

(The following items represent an abbreviated list previously presented in the September, 2004 issue of CAPSLink at <http://www.usp.org/patientSafety/briefsArticlesReports/capsLink/>)

- 1) Conduct a Failure Modes & Effects Analysis (FMEA) for existing pumps, as well as for new pumps that are brought into the facility. Consider what default settings are preprogrammed. Consider if the pumps can be programmed by drug (e.g., morphine PCA vs. hydromorphone PCA). Consider if the pump resets to a default (other than "000," which would require active entry) after it turns off.
- 2) Require proper and complete training and demonstration of competency before staff is permitted to work with pumps.
- 3) Provide written instructions to patients regarding their role in ensuring proper use of patient-controlled analgesia (PCA) pumps. Instruct family members NOT to administer PCA doses—PCA by definition should be administered at the patient's perception of need. Document education of patient and family members. For issues related to PCA by proxy, visit <http://www.ismp.org/msaarticles/issue2.htm>
- 4) Pumps should have upstream occlusion alarms.
- 5) Standardize the strengths/concentrations of IV solutions that often use an IV pump to deliver the solution. Be sure physicians are aware of the standard concentrations in use. If higher concentrations are needed for a particular patient or certain settings, conduct a FMEA to ensure additional safeguards are in place.
- 6) Check for kinked tubing in the pump door. Despite a kink in the tubing, at times no alarm may sound and the volume may be counting down.
- 7) Check whether connections are to IV or epidural lines to prevent wrong route errors.
- 8) Set pumps to be programmed in mg, NOT mL.
- 9) Pumps should be assessed on a regular basis.
- 10) If patient complains of pain, reassess pump settings. Check that the basal rate has been entered. Also check that the tubing is not kinked.

The Joint Commission (www.jcaho.org) is an excellent resource for additional suggestions on how to improve medication safety related to the NPSGs as well as the September 2004 issue of *Joint Commission Perspectives on Patient Safety*.



1. CAPSLink Readership Survey

As announced in the previous two issues, we are surveying readers of this newsletter in an effort to continuously improve its quality. The intent of the survey is to gauge the perceived value and usefulness of the information, recommendations, and news items. As a token of appreciation for your time to complete this survey, USP will send each respondent a **Similar Drug Names Poster**-a wall poster for easy reference that lists look-alike and sound-alike drug names known to cause confusion and potential medication errors when handwritten or communicated verbally.

<http://www.usp.org/survey/CAPS/Reader05E.html>

2. FDA Updates

Mix-ups between ZyPREXA (olanzapine) ZYRTEC (cetirizine HCl): Eli Lilly and FDA notified healthcare professionals regarding reports of medication dispensing or prescribing errors between the antipsychotic ZyPREXA (olanzapine) and the antihistamine ZYRTEC (cetirizine HCl), indicated for the treatment of allergic rhinitis or chronic urticaria. These reports include instances where Zyprexa was incorrectly dispensed for Zyrtec and vice versa, leading to unnecessary adverse events or potential relapse in the patient's suffering.

<http://www.fda.gov/medwatch/SAFETY/2005/safety05.htm#ZyPREXA>

Use of Color on Product Labeling and Packaging being Considered: An FDA public hearing is scheduled for March 7 to discuss issues related to the use of colored labeling and packaging to help differentiate and identify pharmaceutical products. FDA is seeking information from the public to include in its decision making about the risks and benefits of using color to differentiate products and, perhaps, to develop guidance surrounding this issue.

<http://www.fda.gov/OHRMS/DOCKETS/98fr/05n-0036-nm00001.pdf>

Drug Safety Oversight Board to be Established: Recent criticism over safety concerns related to several FDA-approved medications has pushed the agency to establish a new independent Drug Safety Oversight Board to monitor medications once they are on the market. The new board, which will be staffed by FDA employees and medical experts from a variety of government agencies, is charged with creating a new drug safety website that will update physicians and consumers on emerging risks and benefits of medications and steps that can be taken to minimize safety risks.

<http://www.ihealthbeat.org/index.cfm?Action=dsplItem&itemID=109117>

3. JCAHO Updates

Medical Abbreviations Summit: JCAHO is inviting public comments on the preliminary report from its November Medical Abbreviations Summit. People wanting to comment have until March 1 to complete "Medical Abbreviations Summit Field Review" which is available online. [Click here to read more.](#)

4. Initiative Aims to Improve Patients' Literacy Regarding Health Issues

A national project called "Information Rx" is being piloted by physicians in Florida, Iowa, Georgia, and Virginia to inform patients of reputable informational web sites where they can obtain health information about diseases and medications. Those involved in the project give patients Web site addresses as part of their "prescriptions" to help improve their understanding on health issues.

http://www.sptimes.com/2005/02/15/Tampabay/Doctors_have_prescrip.shtml

USP Medication Error Reporting Programs:



MEDMARX[®]—USP's comprehensive, Internet-accessible, anonymous medication errors reporting program, and quality improvement tool. The program facilitates productive and efficient documentation, tracking, trending, and prevention of medication errors.



Medication Errors Reporting (MER) Program—presented in cooperation with the Institute for Safe Medication Practices, this nationwide program makes it possible for health professionals to report medication errors confidentially and anonymously to USP.

Other USP patient safety resources:

- [MEDMARX Annual Data Summary reports](#)—provides readers with a wealth of information on reported error events including patterns in the types, causes, and level of harm associated with medication errors.
- [Understanding and Preventing Medication Errors: A Resource for Healthcare Practitioners](#)—a CD toolkit with practical guidelines, forms, and templates to help healthcare facilities improve error-reduction initiatives.
- [Advancing Patient Safety in U.S. Hospitals: Basic Strategies for Success](#)—a book in which hospitals share stories about how they reduced medication errors and promoted safer patient care.
- Medication Safety Pocket Reference—a pocket-sized reference booklet containing listings of similar drug names and dangerous abbreviations that could cause medication errors. Contact custsvc@usp.org and ask for item #3227702.
- Similar Drug Names Poster—a wall poster for easy reference listing look-alike and sound-alike drug names known to cause confusion and potential medication errors when handwritten or communicated verbally. Posters are packaged in quantities of 1 (item # 3728251) 10 (item # 3728252) and 50 (item # 3728253). Contact custsvc@usp.org and ask for the appropriate item number.

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