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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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## Study Findings and Trends in Medication Error Reporting from 25 Midwestern Critical Access Hospitals<sup>a</sup>

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This issue of CAPSLink focuses on portions of a study published in August, 2006 by the Nebraska Center for Rural Health Research, part of the University of Nebraska Medical Center. The study entitled “Implementing a Program of Patient Safety in Small Rural Hospitals: Findings and Trends in Medication Error Reporting from 25 Critical Access Hospitals” was funded by a grant from the Agency for Healthcare Research and Quality (AHRQ), Grant # 1U18HS015822. Additional information about the study can be found at: <http://www.unmc.edu/rural/documents/pr06-08.pdf>

There are an estimated 4,938 community hospitals in the US, of which thirty-one percent have fewer than 50 beds. As a subset of these community hospitals, there are approximately 1,523 small rural hospitals, of which 70 percent are Critical Access Hospitals (CAHs). CAHs were created by the Balanced Budget Act of 1997, are licensed for up to 25 beds, and have an average inpatient length of stay of 96 hours. Due to low patient volume, one-third of CAHs have a pharmacist on site less than ten hours per week.

In July 2005, The Nebraska Center for Rural Health Research (NCRHR) received one of 17 *Partnerships in Implementing Patient Safety* grants from AHRQ. The primary objective of the Nebraska project was to develop the infrastructure necessary for reporting and analyzing medication errors within small rural hospitals and to use this information to implement evidence-based practices that minimize the latent system causes of these errors.<sup>1</sup> Twenty-five CAHs participated in an educational intervention to teach the “systems” approach to medication error prevention. Data collected throughout the study were reported to MEDMARX by the 25 CAHs during calendar year 2005. The systematic information regarding a reported error's severity, origination,

practices. The researchers also explored the relationship between medication error reporting and limited pharmacist resources.

**Key Findings and Discussion:**

Fourteen of the 25 hospitals that had participated in the project for more than one year demonstrated a positive trend in reporting potential errors (Category A), intercepted errors (Category B), and non-harmful errors that reach the patient (Category C). This increase in reporting over time was interpreted as reflecting growth in a culture of safety—a culture that values reporting as a means to provide information about the quality of care.<sup>2</sup> Specifically, the 14 hospitals that had participated in the project for more than one year, reported a proportion of Category B errors (25%) twice as large as that reported by the remaining 11 hospitals (12%). Table 1 summarizes the distribution of errors by medication error category reported by the 25 CAHs that participated in the project.

**Table 1. Medication Error Reports by Error Category**

Error Category <sup>a</sup>	Total Errors	
	n	%
<i>Potential Error</i>		
A	741	25.09
<i>Intercepted Error</i>		
B	681	23.06
<i>Error Reaches Patient, No Harm</i>		
C	1,385	46.90
D	131	4.44
<i>Error, Harm</i>		
E	11	0.37
F	4	0.14
G	0	0.00
H	0	0.00
<i>Error, Death</i>		
I	0	0.00
Total	2,953	100

a. For complete error category definitions, see: [www.nccmerp.org](http://www.nccmerp.org)

Table 2 summarizes the types of medication errors reported in categories C-I from the 25 CAHs that participated in the project.

**Table 2. Types of Medication Errors<sup>a</sup>**

Error Type	Total Records	
	n	%
Omission error	612	40
Improper dose/quantity	276	18
Unauthorized /wrong drug	230	15
Wrong time	199	13
Extra dose	122	8
Prescribing error	61	4
Wrong dosage form	46	3
Drug prepared incorrectly	31	2
Wrong Administration technique	31	2
Wrong patient	31	2
Wrong route	31	2

**a. Based on 1,531 records and 1,670 selections from CAH data for error categories C-I, MEDMARX data for the period 01/05 - 12/05.**

Selected causes of the reported events indicate that medication errors reached patients in these CAHs due to four primary reasons: procedure/protocol was not followed, transcription and documentation was inaccurate or omitted, there were problems in communication, and/or workflow was disrupted.

In the past year, the Nebraska researchers addressed the main reasons why medication errors reach patients. They conducted interactive workshops and conference calls to teach staff at project hospitals how to conduct aggregate and individual root cause analysis. They emphasized that the purpose of these activities is to identify system sources of errors and to determine whether new policies/procedures are needed to ensure systems are consistent with evidence-based safe medication practices. Additionally, the researchers provided education about the TeamSTEPPS program<sup>3</sup> which stands for Team Strategies and Tools to Enhance Performance and Patient Safety, and was developed by AHRQ and the Department of Defense Military Health System. TeamSTEPPS training emphasizes competency in four core skills: team leadership, situation monitoring, mutual support, and communication. Lastly, the researchers re-evaluated the culture of safety within each organization using the AHRQ

## Hospital Survey on Patient Safety Culture.

### **Case Examples from NCRHR Study Involving Harmful Medication Errors<sup>b</sup>**

1. Hydrocodone with acetaminophen was given to a patient by mouth at 5:30 a.m. followed by a second dose of the same drug at 6:30 a.m. even though a discontinuation order had previously been written. The patient was noted to have increased lethargy, and the registered nurse began oxygen saturation monitoring and increased observation. This extra dose resulted from a delay in noting the drug's discontinuation. Actions taken included informing the staff members who were involved with the error and providing education about pain medication and safe pain management practices.

2. A patient was discharged from a facility with a medication order for "furosemide 40 mg bid." The registered nurse who wrote out the discharge instructions incorrectly transcribed the order as "furosemide 40 mg qd." The patient took furosemide as instructed (once a day). Four days after discharge, the patient came to the emergency room with fluid overload, shortness of breath, and other associated symptoms. The patient required readmission to the hospital and treatment including diuresis. The error was classified as category F and the error type was an incorrect dose (under-dose) caused by a transcription error. A primary contributing factor documented was the lack of a 24-hour pharmacy service and actions taken included staff education.

3. A hospitalized patient complained of increased pain. Upon review of the patient's chart, it was noted that the patient was due to receive a Duragesic™ patch change two days prior. The order for the patch change was not transcribed to the new medication administration record when the patient was transferred from one unit to another. The error was classified as category E and the error type was documented as an omission error caused by medication administration record (MAR) variance. A cited contributing factor was the lack of a 24-hour pharmacy service. Actions taken subsequent to the error included staff education on the importance of double checking MAR order transcriptions, particularly upon patient transfer.

### **Recommendations from CAH Medication Error Reporting Study**

- Foster a "just culture" that encourages non-punitive, voluntary reporting of medication errors.
- Share systems information from reported errors with all staff to ensure

organizational learning.

- Implement proven medication safety “Best Practices” that are consistent with the Joint Commission’s (JC) medication-related National Patient Safety Goals.
- Increase nursing staff access to the knowledge and expertise of clinical pharmacists through collaborations with network hospitals and implementation of telepharmacy services.

<sup>a</sup> This story is an adaptation of a recently published study from the University of Nebraska Medical Center by the Nebraska Center for Rural Health Research, 2005 Data Report PR06-08. Permission granted.

<sup>b</sup> Case reports reflect actual error descriptions but may have been modified for clarity.

#### **References:**

1. Leonard, M., et al. (2004). Achieving safe and reliable healthcare: Strategies and solutions. Chicago Health Administration Press.
2. Marx, D. (April 14, 2004). Errors: A balance between learning and accountability. Presented to the Michigan Health and Safety Coalition.
3. Agency for Healthcare Research and Quality. (October 2006). TeamSTEPPS: Strategies and Tools to Enhance Performance and Patient Safety. Retrieved April 5, 2007 from [www.shrq.gov/qual/Teamstepps/](http://www.shrq.gov/qual/Teamstepps/).



### **1. USP-ISMP Workshops: Using Data Effectively to Manage the Risks to Medication Safety**

This one-day interactive program is designed for pharmacy directors, risk managers, patient safety officers, medication safety officers, and other healthcare professionals seeking to enhance their ability to collect, analyze, and prioritize medication error and other adverse drug event data. Participants will learn how to select effective risk reduction strategies based on proven medication safety principles, instead of relying on human vigilance alone. They also will learn the best way to report findings in an actionable format that will help drive medication safety efforts and show results from system improvements. The workshops include home study materials and will include breakout sessions with an opportunity to gain hands-on practice working with data. Pharmacy and Nursing CE credit will be available.

**Agenda Topics will cover the following:**

- Risk identification: Data collection methods
- Risk analysis: Analysis of aggregate data for trending
- Risk control: Choosing effective error reduction strategies
- Case studies: Examining data, priority setting, and interventions

### **Fees and Registration**

Early registration: \$350.00 (up to 21 days before program date)

Regular registration: \$395.00

Group discounts: For more information and a group code number for online registration, call 301-816-8136

Register at <http://www.intellor.com/usp/ismp>

### **Workshop Dates**

#### **September 25, 2007**

8:00 a.m.–4:30 p.m.

Hyatt Regency Tampa

Tampa, FL

#### **October 9, 2007**

Before the ASHRM Annual Conference

10:00 a.m.–5:30 p.m.

Hyatt Regency Chicago

Chicago, IL

#### **November 5, 2007**

8:00 a.m.–4:30 p.m.

USP Headquarters

Rockville, MD

#### **December 1, 2007**

Before the ASHP Midyear

8:00 a.m.–4:30 p.m.

Imperial Palace Hotel

Las Vegas, NV

### **2. Important Computer Alerts that Should Not be Missed**

Although pharmacists typically enter medication orders into the pharmacy computer system, in some settings, pharmacy technicians or other trained pharmacy staff perform this function. One critical safety concern still exists with this process is that the checking pharmacist may not know about alerts that were bypassed during the order entry process. While bypassing some clinically insignificant alerts may often be appropriate, sometimes important warnings are inappropriately overridden. The practice of bypassing alerts appears to be common, especially if the significance of the alert is not valued by the viewer. For full text article [click here](#).

### **3. FDA Issues Potential Safety Alert for Avandia**

On May 21, 2007 the FDA issued a potential safety alert for GlaxoSmithKline's

Drug Avandia (rosiglitazone maleate) The alert is based on recently published safety data from a combined analysis of controlled clinical trials that documented a significant increase in the risk of heart attack and heart-related deaths to patients taking Avandia. Myocardial ischemic events are currently described in the WARNINGS section of the drug's label. The FDA's review is ongoing, and the agency has not confirmed the clinical significance of the reported increased risk of ischemic cardiovascular events in the context of other studies. The FDA will continue to monitor the issues and provide emerging information to prescribers so that they and their patients can make informed treatment decisions. For more detailed information, [click here](#).

#### **4. FDA Announces New Counterfeit Drug Protections**

The FDA's Counterfeit Drug Task Force recently announced new steps to improve existing protections against the growing problem of counterfeit drugs. The FDA will fully implement regulations related to the Prescription Drug Marketing Act of 1987, which requires drug distributors to provide documentation of the chain of custody of drug products, referred to as the drug's "pedigree," throughout the distribution system. A potential new measure to safeguard the drug supply is the use of electronic track and trace technology, such as radio-frequency identification (RFID), which creates an electronic pedigree (e-pedigree) for tracking the movement of the drug through the supply chain. Additional information available at:

<http://www.fda.gov/bbs/topics/NEWS/2006/NEW01386.html>

All Task Force Reports are posted on FDA's Web at [www.fda.gov/counterfeit](http://www.fda.gov/counterfeit).

#### **5. Patients with Heart Failure Benefit from Pharmacist's Care**

In a study published in the May 15, 2007 issue of the Annals of Internal Medicine, a randomized, controlled trial conducted from February 2001 to June 2004 on 314 low-income patients 50 years of age or older with heart failure confirmed that a pharmacist intervention for outpatients with heart failure can improve adherence to cardiovascular medications and decrease both health care utilization and costs. However, the benefit probably requires constant intervention with the patient because the effect dissipates when the intervention ends. The study documented that during the 9-month intervention period, medication adherence was 67.9% and 78.8% in the usual care and intervention groups, respectively. Medications were taken on schedule 47.2% of the time in the usual care group and 53.1% of the time in the intervention group. Emergency department visits and hospital admissions were 19.4% less and

annual direct health care costs were lower in the intervention group. Full text of article available at:

<http://www.annals.org/cgi/content/full/146/10/714>

## **6. Pediatric Patients Receiving Chemotherapy Often Experience Errors**

Children receiving chemotherapy are often given the drugs at the wrong time, and many require treatment because of errors. In total, According to a study led by Dr. Marlene Miller, associate professor of pediatrics at the Johns Hopkins School of Medicine, 85 percent of these drug errors were not spotted until the child received the medication. Prescribing errors accounted for 10 percent of the cases. Most errors (48 percent) involved mistakes in administration, followed by errors in dispensing (30 percent). The research was published online May 25, 2007 in the journal *Cancer*, and is available in print in the journal's July 2007 issue. Article abstract available at: [Click here.](#)

## **7. Hospital ADEs are Frequently not caused by Errors**

An April 2007 report released by the Agency for Healthcare Research and Quality (AHRQ) describes the types of patients seen with adverse drug events (ADEs) in U.S. hospitals, and details that most ADEs reported (90.3 percent) were attributed to the side effects of properly administered medications. The medications were properly administered in therapeutic and prophylactic dosages but patients experienced an adverse event such as an allergic or hypersensitivity reaction. Only 8.6 percent of ADEs were attributed to patients receiving an incorrect medication or dose in the hospital or from patients accidentally taking an incorrect dose or the wrong medication before being admitted. Slightly more than 1.1 percent of the ADEs were classified as neuropathy or dermatitis due to medications. The data indicated that ADEs were found in approximately 3.1 percent of all hospital stays. [Click here to read more.](#)

## **8. USP 2007 Annual Scientific Meeting**

The 2007 USP Annual Scientific Meeting will be held on September 25-27, 2007 in Tampa, Florida at the Hyatt Regency Hotel. The theme of this year's meeting is *Quality of Manufactured Medicines and Quality of Care*. This three-day meeting is designed for scientists and practitioners and will include sessions on labeling issues for small and large volume parenterals that were recently addressed during the FDA/Institute for Safe Medication Practices (ISMP)/USP conference on *Improving Patient Safety by Enhancing the Container Labeling for Parenteral Infusion Drug Products*.

**Agenda Topics that will be covered during the meeting include:**

**Wednesday, September 26**

- Quality of Care: Medication Safety Topics
- Quality of Care: Good Naming Practices that Prevent Medication Errors

**Thursday, September 27**

- International Health: Global Procurement of Medicines, Quality Considerations
- International Health: Counterfeits-International Perspective

**FEES AND REGISTRATION**

Registration fees begin at \$400.00.

More detailed information on the meeting and registration is available from:

[www.usp.org/goto/asm](http://www.usp.org/goto/asm)

Phone: 301-816-8134

Email requesting additional conference information from [conferences@usp.org](mailto:conferences@usp.org)

**USP Medication Error Reporting Programs:**



**MEDMARX**<sup>®</sup>—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](mailto: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](mailto:custsvc@usp.org) and ask for the appropriate item number.

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