

## MEDICATION ERRORS

Medication errors are among the most common medical mistakes. They harm at least 1.5 million people per year. An Institute of Medicine (IOM) report indicates that an *estimated* 400,000 preventable injuries may occur each year in hospitals. Another 800,000 may occur in long-term care settings, and roughly 530,000 occur just among Medicare recipients in outpatient settings.

At HHC, medication error is defined as any preventable event that may cause or lead to inappropriate medication use or patient harm, while the medication is in the control of the health care professional, patient or consumer. Such events may be related to professional practice, health care products, procedures, and systems including: prescribing; order communication; product labeling and nomenclature; compounding; dispensing; distribution; administration; education; monitoring; and use (National Coordinating Council for Medication Error Reporting Program (NCC MERP).

Every phase in patient care involves a potential for error and some degree of risk to patient safety. Understanding the factors that increase medication errors is the first step in preventing them.

Medication errors can arise from human errors (60-80%) and/or system failures (ICN Fact Sheet). Human errors can include: problems in practice (i.e., taking short cuts), training deficiencies, undue time pressure, distractions, and poor perception of risk.

Systems failures can be related to products, procedures or systems.



Figure 1. Package Labels WITHOUT Tall Man Lettering. Image provided courtesy of ISMP.



Figure 2. Package Labels WITH Tall Man Lettering. Image provided courtesy of ISMP.

The American Hospital Association lists the following as some common types of medication errors:

- incomplete patient information (not knowing patients' allergies, other medicines they are taking, previous diagnoses, and lab results);
- unavailable drug information (such as lack of up-to-date warnings);
- miscommunication of drug orders, which can involve poor handwriting, confusion between drugs with similar names, misuse of zeroes of decimal points, confusion of metric and other dosing units, and inappropriate abbreviations;
- lack of appropriate labeling as a drug is prepared and repackaged into smaller units;
- environmental factors such as heat, lighting, noise, and interruptions;
- failure to follow established facility policies and procedures.

According to Diane Cousins, Vice President of U.S. Pharmacopeia, data from the MEDMARX®, a national medication error and adverse drug reaction reporting program show **the point of medication errors occurred:**

- 37% at time of medication administration
- 26% in documenting the medication administered
- 21% at time of dispensing the medication

Of the above,

- 29% involved failure to administer an ordered dose
- 21% involved improper dose
- 14% involved prescribing errors

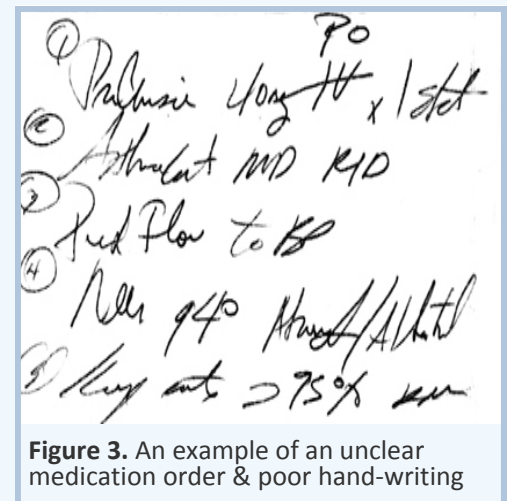


Figure 3. An example of an unclear medication order & poor hand-writing

Medication error prevention requires collaboration between the patient, health care team and management. Vigilance, the act of checking and double checking, and reviewing system functions are the best defense in preventing human errors. Reporting errors and performing critical analysis of data are also important in reducing errors because they support continuous quality improvement.

## Case Study #1

A 60-year-old woman presented as an outpatient for a renal scan. As part of the procedure she was given oral Captopril (25mgs). Captopril is classified as an ACE (Angiotensin Converting Enzyme) inhibiting drug that causes blood vessels to enlarge with the effect of reducing the patient's blood pressure.

According to her prior medical records, she had been followed at the Primary Care Clinic. Her medical records noted that she had an allergy to Fosinopril (another type of ACE inhibiting drug) and that she had previously presented to the hospital for an allergic reaction after reportedly taking Fosinopril.

The ordering physician in the primary care clinic did not check her previous records for allergies before advising the resident physician to order the renal scan.

On the day of the scan, the radiology staff relied upon the primary care physician's assessment of the patient's history for allergies but did not independently inquire or obtain a history regarding allergic reactions to medications.

Several hours after her discharge, the patient arrived back at the ED by ambulance with complaints of difficulty swallowing and a hoarse voice.

Her examination noted edema of the soft palate, uvula, tongue and floor of the mouth. She was diagnosed with laryngeal edema and treated with Epinephrine, Benadryl, Solumedrol and Pepcid.

The patient was intubated and a direct laryngoscope was performed in the OR. Thereafter, the patient was transferred to the ICU for six days and following that to a medical floor for an additional two days before being discharged.

### Outcome:

A law suit was filed and the plaintiff alleged that although hospital personnel were informed of her prior history of an allergic reaction to ACE inhibiting drugs, medication was inappropriately administered which caused her to be hospitalized.

*A settlement of \$100,000 was reached by HHC*

## LESSONS LEARNED

All providers across the continuum of care should obtain a history and assess for the potential risk of an allergic or adverse reaction to medications and or substances that are ordered prior to administration and document appropriately in the medical record.

Questions regarding cross reactivity of drugs should be referred to pharmacy or obtained from a current drug reference or manual.

## Case Study #2

An eight-year old female was brought to the Emergency Department after being struck by a car. A head CT revealed a small subdural hematoma and a non-depressed temporal bone fracture. A neurosurgery consult was obtained and Dilantin 5mg/kg/day in three divided doses for seven days were recommended. The patient weighed 25.6 kg. A loading dose of IV Cerebyx was given in the ED and the child was transferred to the Pediatric ICU for observation.

The admitting surgery resident (PGY-II) ordered Dilantin 125mg BID (double the neurosurgeon's recommendation) without a time limit. A follow-up head CT revealed no changes, and the patient was discharged home (three days after admission) with follow-up clinic appointments.

The discharge summaries by the physician and nurse both noted the mother was given a prescription for 100mg Dilantin three times a day (two 50mg tablets three times a day) without a date for its discontinuance.

While the attending surgeon documented the patient should receive "the maintenance dose," the recommended dose was not specified. The issue of an order for adult dosages of Dilantin was not raised by the staff.

One week later, the patient was readmitted with balance problems, slurred speech, rash over her face and body, fever and vomiting. A lumbar puncture and head CT were included in the work-up, and the admitting diagnosis was

“rule out meningoencephaly” and “rule out Dilantin toxicity”.

A dermatology consult was obtained, and after ruling out Dilantin Hypersensitivity Syndrome, the patient was diagnosed with drug rash to Dilantin. She remained hospitalized for a week until her symptoms resolved and the Dilantin level decreased.

The red rash faded, but many flat, dark pigmented areas remained on her face and body. Over the next months, the spots faded from her face, but remained on the rest of her body, and she was diagnosed with post-inflammatory hyperpigmentation.

### Outcome

A law suit was filed alleging a failure to dispense the proper medication in the proper dosage, a failure to warn of the consequences and a failure to interpret physicians' directives in a proper manner.

## A settlement of \$150,000 was reached by HHC

### LESSONS LEARNED

Providers must verify the medications that are ordered and administered to patients at all stages of care.

Prior to ordering, administering or educating a patient on any medication, the provider must be knowledgeable about the medication's purpose, actions, appropriate dose for that particular patient, and patient specific information (i.e., patient's age, condition, weight, allergies, and other medications that the patient may be taking that was prescribed and/or over the counter/herbal remedies).

If a provider is unfamiliar with a medication, he/she should refer to a current drug reference or consult with the pharmacy.

Acknowledgement of consultant's recommendation(s), including management of a patient and medications orders, should be documented in the medical record. If the recommendations are not followed, the provider's reasons for the decision should be documented.

## Recommendations for Preventing Medication Errors

### **For Prescribers: Prescribing is an early point at which medication errors can arise.**

- Stay knowledgeable with current literature review, consultation with pharmacists, consultation with other physicians, and participation in continuing professional education.
- Evaluate the patient's total status and review all existing drug therapies before prescribing new or additional medications to ascertain possible antagonistic or complementary drug reaction(s).
- Drug orders should include patient name, generic name, trademarked name (if a specific product is required), route and site of administra-

tion, dosage form, dose, strength, quantity, frequency of administration, and prescriber's name. In some cases a dilution rate, and time of administration should be specified. The desired therapeutic outcome for each drug should be expressed when prescribed.

- Ensure that the intent of the medication orders is clear and unambiguous – i.e., clear instructions, specify exact dosage strengths, eliminate “do not use abbreviations”.
- The prescriber should talk with the patient or caregiver to explain the medication prescribed and any special precautions or observations must be indicated, including any

allergic or hypersensitivity reactions that may occur.

- The prescriber should follow up and evaluate the need for continued drug therapy for individual patients.

### Medication Reconciliation

Medication reconciliation, the process of comparing a patient's medication orders to all of the medications that the patient is taking, can prevent medication errors such as omissions, duplications, dosing errors, or drug interactions. It should be done at every transition of care in which new medications are ordered or existing medications are reordered.

**For Pharmacists:** The pharmacist plays a pivotal role in preventing medication misuse.

- Collaborate with prescribers and nurses in developing, implementing, and monitoring the therapeutic plan to produce defined therapeutic outcomes for the patient.
- Assess therapeutic appropriateness, medication administration appropriateness, and possible duplicate therapies; review for possible interactions; and evaluate pertinent clinical and laboratory data.
- Be familiar with drug distribution policies and procedures established for the organizational setting to provide for safe distribution of all medications and related supplies.
- Never assume or guess the intent of confusing medication orders. If there are any questions, the prescribers should be contacted prior to dispensing.
- Maintain orderliness and cleanliness in the work area where medications are prepared and perform one procedure at a time with as few interruptions as possible.
- Review the original medication order before dispensing. Pharmacists must make certain that the following are accurate: drug, labeling, packaging, quantity, dose, and instructions.
- Observe how medications are actually being used in patient-care areas to ensure that dispensing and storage procedures are followed as recommended.
- Review medications that are returned to the department. Such review processes may reveal system breakdowns or problems that resulted in medication errors (e.g., omitted doses and unauthorized drugs).
- Counsel patients or caregivers and verify that they understand why a medication was prescribed and dispensed, its intended use, any special precautions that might be observed, and other needed information.

**For Nurses:** By virtue of their direct involvement in patient-care activities, nurses are in the best position to detect and report medication errors. Nurses are the final point in the checks and balances triad.

- Review medications with respect to desired outcomes, therapeutic duplications, and possible drug interactions.
- Verify all drug orders before medication administration. Review original orders before administration and compare them with medications dispensed.
- Verify patient identity (use two unique identifiers) before the administration of any medication.
- Practice the "5 Rights" - Right Name (patient), Drug, Time, Dose, and Route.
- Document in the patient's chart whether the medication has been administered or not. If not, describe why it was not administered.
- Observe patients for medication responses and reactions, especially after the first dose.
- Call pharmacy when the packaging of the medication you are about to administer looks different than it did the last time you gave it; two or more vials of one medication are not enough for the amount you should administer; you suspect something about the medication you are about to administer is not correct – the information on the label is not clear or you have doubts given the patient's allergy, or if you have any medication-related questions.
- Talk with patients or caregivers to ascertain that they understand the use of their medications and any special precautions or observations that might be indicated.

*Sources:*

*ASHP Guidelines on Preventing Medication Errors in Hospital*

*American Hospital Association, Health Research & Educational Trust, and the Institute for Safe Medical Practices*

## Summary

Every employee, no matter what their job responsibility, should feel comfortable communicating mistakes that occur in the workplace, whether those mistakes resulted in harm or simply presented potential harm. Only through open and honest discussion of mistakes, systems failures, errors or misunderstandings can changes be made to improve performance and prevent harm.

If you believe a medication error has occurred, communicate it to your supervisor and complete an incident report form. You should know that HHC facilities have systems or special dedicated phone "hot-lines" to help staff report patient safety problems they observe. You can report this information confidentially. Check out your facility's hotline number or ask your Patient Safety Officer about how you can report patient safety issues in your facility. Visit the online Corporate Patient Safety Gateway at <http://patientsafety.nychhc.org/> to view a list of Patient Safety Officers and to learn more about patient safety efforts throughout HHC.

## References:

- American Hospital Association. [http://www.aha.org/aha\\_app/issues/Quality-and-Patient-Safety/index.jsp](http://www.aha.org/aha_app/issues/Quality-and-Patient-Safety/index.jsp)
- ASHP (American Society of Health-System Pharmacists) Guidelines on Preventing Medication Errors in Hospitals, pp 129-137. [www.ashp.org](http://www.ashp.org)
- Institute for Safe Medication Practices. Pathways for Medication Safety. <http://www.ismp.org/Tools/pathways.asp>
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