

# MEDICATION ERRORS



Hertha Darezzo, CPhT  
Our Lady of Fatima Hospital  
CharterCARE Health Partners

# OBJECTIVES

- Understand and appreciate the importance of recognizing and minimizing medication errors.
  - Identify different types of medication errors.
  - To realize the impact Pharmacy Technicians can have in preventing and / or correcting medication errors.
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# DISCLOSURES

- ▶ I have no relevant financial relationships to disclose.

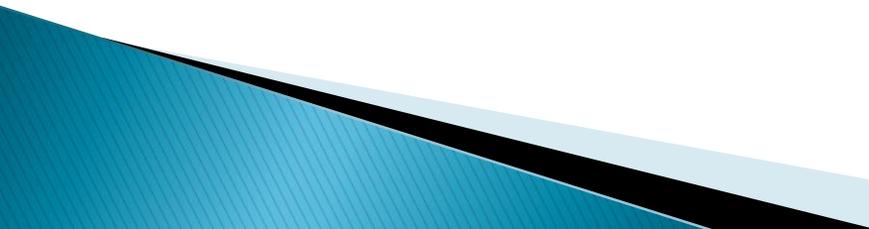
# MEDICATION ERRORS

- A medication error is defined as any preventable action or omission that may contribute to the inappropriate or harmful use of a medicine by a health professional, patient, or caregiver.
  - Medication errors can occur at any point during the medication use process and in any setting.
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# MEDICATION ERRORS

- Pharmacists are responsible for the safe and appropriate use of medications in all pharmacy practice settings.
  - However, as pharmacists responsibilities expand, pharmacy technicians need to be more aware of the significance and causes of medication errors and to recognize their role in preventing those errors.
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# LEGAL LIABILITY

- Technicians and pharmacists both contribute to the safe use of medications by the public. If their actions result in patient harm, they may both be held legally liable for their actions, along with the institution and others involved.
  - By preventing medication errors, patient safety is improved and the potential for subsequent legal consequences is decreased.
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# LEGAL LIABILITY

- Technicians and pharmacists may be held legally responsible for a medication error that causes harm to a patient.
  - a. True
  - b. False

Answer:

a. True



# TYPES OF MEDICATION ERRORS

Prescribing

Omission

Wrong Time

Improper Dose

Wrong Drug Preparation

Deteriorated Drug

Monitoring

Compliance

# PRESCRIBING

- Incorrect drug, dose, dosage form
  - Incorrect route of administration
  - Incorrect length of therapy
  - Incorrect number of doses
  - Inappropriate rate of administration
  - Wrong drug concentration
  - Wrong instructions for use
  - Illegible handwriting
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# SALAD = SOUND ALIKE AND LOOK ALIKE DRUG NAMES

- Errors can occur because drug names look and sound similar and may even be used to treat a common condition.
  - Hydralazine and Hydroxyzine sound very similar and come in the same strength.
  - Heparin and Hespan
  - Ephedrine and Epinephrine
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# OMISSION

- Failure to administer an ordered dose to a patient before the next scheduled dose is due.
- An omission error occurs when a dose is completely omitted as opposed to administered late.
- Examples when an omitted dose is NOT an error:
  - If a dose is ordered to be held for medical reasons
  - When the patient is NPO
  - Waiting for drug level results to come back
  - If patient refuses

# OMISSION

- Omission errors are less likely to result in negative outcomes than improper dose errors because the patient is not receiving a harmful dose.
  - a. True
  - b. False

Answer:

**b. False**



## WRONG TIME

- The timing of administration of drugs is critical to the effectiveness of some medications.
  - Maintaining an adequate blood level of some drugs, such as antibiotics, frequently depends on evenly spaced, around-the-clock dosing.
  - Administering doses too early or too late may affect the drug serum level and consequently the efficacy of the drug.
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## IMPROPER DOSE

- Improper dose errors occur when a patient is given a dose that is greater or less than the prescribed dose.
  - This type of error may occur if there is a delay in documenting a dose – or absence of documentation – that results in an additional dose being administered.
  - Inaccurate measurement of an oral liquid.
  - Excluded are doses that cannot be accurately measured as in topical applications.
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## WRONG DRUG PREPARATION

- Drugs requiring reconstitution (adding liquid to dissolve a powdered drug), dilution, or special preparation prior to dispensing or administration.
  - Example: Reconstituting a cephalexin oral suspension with an incorrect volume of water.
  - Using incorrect diluent for reconstitution of a powder for injection.
  - Using a wrong base product when compounding an ointment.
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# WRONG DRUG PREPARATION

- Which of the following would be considered a wrong drug preparation error?
  - a. using the wrong base product to compound a skin ointment
  - b. adding an incorrect volume of water to reconstitute a 80 ml bottle of amoxicillin oral suspension 125 mg / 5 ml
  - c. using the wrong diluent to reconstitute a lyophilized powder for injection
  - d. all of the above

Answer:

**d. All of the above**

## DETERIORATED DRUGS

- Monitoring expiration dates of products is very important. Drugs used past their expiration date may have lost potency and may be less effective or ineffective.
  - Refrigerated drugs stored at room temperature may decompose to the point that their efficacy is less than optimal.
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# MONITORING ERRORS

- Monitoring errors result from inadequate drug therapy review.
  - Example: Ordering serum drug levels for a patient on phenytoin (seizure medication) but not reviewing them or not responding to a level outside of the therapeutic range.
  - Not ordering drug levels when required or prescribing an antihypertensive agent, which lowers blood pressure, and failing to check blood pressure.
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# COMPLIANCE

- Medication errors are committed by patients, too, when they fail to adhere to a prescribed drug regimen.
  - These errors may be detected when a patient requests refills for prescriptions at unreasonable intervals (too long after or too soon before a refill is due) without a reasonable explanation.
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# COMPLIANCE

- Cost
  - Feeling better or feeling “cured”
  - Sharing medications
  - Social isolation ( living alone )
  - Misunderstanding directions
  - Side effects
  - Forgetfulness
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# CAUSES OF MEDICATION ERROR

Calculation errors

Careless use of zeros and decimal points

Inappropriate use of abbreviations

Illegible handwriting

Missing information

Drug product characteristics

Compounding / drug preparation errors

Prescription labeling

Work environment / Staffing issues

# CALCULATION ERRORS

- Calculation errors are often made by using the wrong concentration of stock solutions, misplacing a decimal point, or using wrong conversions.
  - Personnel also neglect to double-check their work, rely on their memory instead of looking up a conversion, or do not ask themselves, “Does the answer seem reasonable?”
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## DECIMAL POINTS AND ZEROS

- Misuse of a leading or trailing zero can also lead to a 10-fold over-or-under dosing of a medication.
- If a warfarin dose for “1 mg” is written as “1.0” mg with a trailing zero, it can easily be read as “10 mg,” leading to a 10-fold overdose. Likewise, the omission of a leading zero in writing “0.5 mg” as “.5 mg” could also lead to a 10-fold overdose if “5 mg” is mistakenly dispensed.

- Which of the following is LEAST likely to lead to a wrong dose error?
  - a. 4 mg
  - b. .4 g
  - c. 4 U
  - d. 4.0 units

Answer:

a. 4 mg

# DANGEROUS ABBREVIATIONS

Abbreviation	Intended meaning	Common Error
U	Units	Mistaken as a zero or a four (4) resulting in overdose. Also mistaken for "cc" (cubic centimeters) when poorly written.
µg	Micrograms	Mistaken for "mg" (milligrams) resulting in an overdose.
Q.D.	Latin abbreviation for every day	The period after the "Q" has sometimes been mistaken for an "I," and the drug has been given "QID" (four times daily) rather than daily.
Q.O.D.	Latin abbreviation for every other day	Misinterpreted as "QD" (daily) or "QID" (four times daily). If the "O" is poorly written, it looks like a period or "I."
SC or SQ	Subcutaneous	Mistaken as "SL" (sublingual) when poorly written.
T I W	Three times a week	Misinterpreted as "three times a day" or "twice a week."
D/C	Discharge; also discontinue	Patient's medications have been prematurely discontinued when D/C, (intended to mean "discharge") was misinterpreted as "discontinue," because it was followed by a list of drugs.
HS	Half strength	Misinterpreted as the Latin abbreviation "HS" (hour of sleep).
cc	Cubic centimeters	Mistaken as "U" (units) when poorly written.
AU, AS, AD	Latin abbreviation for both ears; left ear; right ear	Misinterpreted as the Latin abbreviation "OU" (both eyes); "OS" (left eye); "OD" (right eye)
IU	International Unit	Mistaken as IV (intravenous) or 10(ten)
MS, MSO4, MgSO4	Confused for one another	Can mean morphine sulfate or magnesium sulfate

# HIGH-ALERT MEDICATIONS

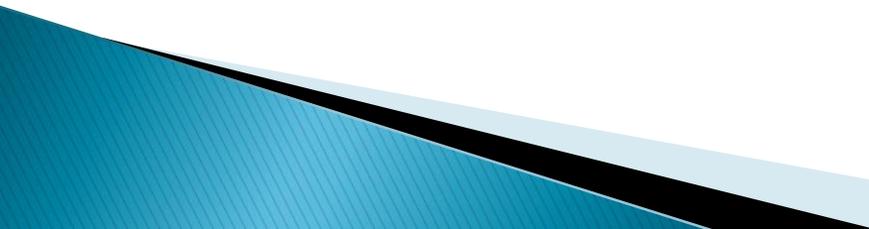
- A high-alert medication is one that has a high risk of causing injury when it is misused.
  - Medication errors may not occur more commonly with high-alert medications, but the consequences of an error can be devastating.
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# HIGH-ALERT MEDICATIONS

- Insulin is a high-alert medication.
  - U-500 insulin is particularly prone to medication errors due to its increased concentration and different dosing regimen as compared to other U-100 insulin strengths.
  - A medication error with U-500 insulin can lead to a 5-fold overdose, hypoglycemia, and potentially death.
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# HIGH-ALERT MEDICATIONS

Examples of high-alert medications:

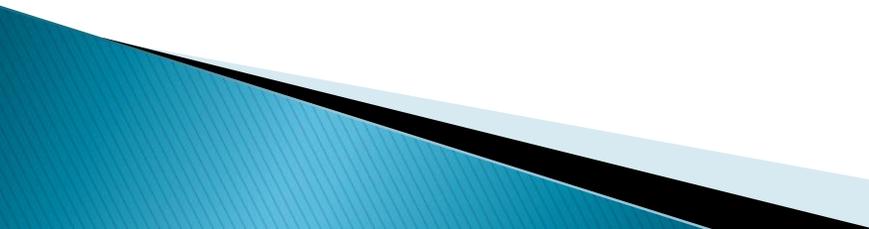
- Insulin
  - Potassium chloride Injection
  - Heparin
  - Concentrated sodium chloride (>0.9%)
  - Narcotics
  - Epidurals
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## RETAIL

- Retail pharmacy technicians are crucial in preventing errors.
  - They are typically the first and last individual to communicate with a patient at a pharmacy, as well as often being responsible for entering the prescription information into the computer and preparing the medication.
  - Technicians are able to alert pharmacists of potential errors, drug interactions, allergies, etc., which puts them at the front line of avoiding medication errors.
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# PRESCRIPTION DROP OFF

## CHECK LIST of important questions to ask

- **NEED 2 PATIENT IDENTIFIERS**
  - Correct spelling of name
  - Date of birth
  - Allergies
  - Phone number
  - Address
  - Medical condition if possible (ex. pregnancy)
  - All new information should be updated
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# ORDER ENTRY / FILLING

- Thoroughly read prescription
  - Verify drug name
  - Carefully enter drug and strength
  - Enter CLEAR instructions
  - Fill with correct medication and strength
  - Use bar codes
  - Use AUXILLIARY labels
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# POINT OF SALE

Ask person picking up prescription:

- Who is the prescription for?
- **NEED SECOND IDENTIFIER**
- Address and date of birth

DISCUSS WITH PATIENT:

- Any changes in medication
- Changes in dose
- Storing medication (Ex. Refrigerate)
- Go over instructions (Ex. INSERT suppository)
- Ask if patient needs pharmacist counseling

- Safeguards established in the pharmacy were developed to prevent medication errors or in response to them.
  - Bypassing such systems, including computer alerts and bar coding, increases the risk of medication errors.
  - Proper education empowers the patient to participate in their health care and safeguard against errors.
  - External reporting of errors, near misses, and adverse events help facilitate changes to make the practice of pharmacy more safe.
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