MEDICATION SAFETY AND THE ROLE OF THE PHARMACY TECHNICIAN

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Objectives

- Define medication error and explain the reasons for reporting medication errors.
- Identify the incidence of medication errors and the impact on the patient and healthcare system associated with them.
- Describe the critical components in the medication use process and identify common types of medication errors that may occur in the medication use process.
- Discuss specific techniques used to evaluate and reduce medication errors.
- Describe the role a pharmacy technician has in preventing medication errors and promoting patient safety.

Patient Safety

- WHO defines patient safety as the prevention of errors and adverse effects to patients associated with health care.
- In developed countries as many as one in 10 patients is harmed while receiving hospital care.
- Hospital infections affect 14 out of every 100 patients admitted.
- 20-40% of all health spending is wasted due to poor-quality care.

Medication Error

- A medication error is "any error occurring in the medication use process." 
- The National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP) defines a medication error 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, packaging, and nomenclature; compounding; dispensing; distribution; administration; education; monitoring; and use."

Medication Error (Y/N)

- A patient is seen in clinic and prescribed Bactrim DS. After a couple of doses the patient returns to the clinic due to hives and itching.
- The pharmacy dispensed cefazolin 2 grams instead of cefepime 2 grams. The incorrect medication was not given to the patient because the nurse noticed the wrong medication was dispensed.
- The provider wrote a prescription for the patient to receive 150 mg enoxaparin subcutaneous twice a day. The pharmacy filled the prescription as ordered. The patient should have received this dose once a day. No harm to the patient was evident.
- The patient was instructed to take Augmentin twice daily for a sinus infection. After a couple of days the patient experienced GI side effects and not taking the medication. They went to urgent care and received a different antibiotic to treat the sinus infection.

Incidence and Impact of Medication Errors

- Serious medication errors occur in 5-10% of patients admitted to hospitals.
- The FDA estimates that 1.3 million people are injured annually in the US following medication errors.
- Adverse drug events cause more than 770,000 injuries and deaths each year and cost up to $5.6 million per hospital.
- Medication errors cost the U.S. $4 billion a year.
- There are ~7,000 deaths per year (19 deaths per day) due to medication errors.

References:

Self-Assessment

Which of the following is a medication error?

A. Patient LR received a medication labeled for Patient BS. Luckily, the medication, dose, and route were the same so no patient harm resulted.
B. The Automated Dispensing Cabinet (ADC) on the nursing unit was out of docusate sodium. The medication was charted as not given and the next dose was given on time.
C. When the patient was admitted to the hospital he stated an allergy to codeine. This was not recorded in the patient's chart. The patient received multiple doses of acetaminophen with codeine and never experienced signs of an allergic reaction.
D. All of the above

The Medication Use Process

- Prescribing
- Order Processing
- Preparation and Dispensing
- Administration
- Effects Monitoring

Ten Key Elements of the Medication Use Process

- Patient information
  - Age, height, weight, allergies, labs
- Drug information
  - References, protocols, formulary
  - Communication of drug information
  - Among health care team
- Drug labeling, packaging and nomenclature
  - Sound Alike Look Alike Drugs (SALAD), product labeling
- Drug storage, stock, standardization, and distribution
  - Standardize administration times, drug concentrations, time availability
- Drug device acquisition, use and monitoring
  - Safety assessment before and after acquisition
  - Environmental factors
    - Poor lighting, noise, interruptions, workflow
  - Staff competency and education
    - New medications, processes, errors, high-alert medications
- Patient Education
  - Drug names, indication, doses
- Quality Processes and Risk Management
  - Redesign systems and processes to prevent errors

Prescribing

- Correct medication for the patient based on current illness and patient medical history
- It is estimated that up to 39% of medication errors occur during prescribing

Common errors:
- Dosing errors
- Incorrect medication
- Drug/drug interactions
- Drug/allergy interactions

Order Processing

- Approximately 12% of medication errors occur during order processing

Common errors
- Wrong drug, dose, dosage form, frequency
- Errors of Omission

Factors influencing prescribing and order processing errors
- Environmental factors
  - Conformational bias
  - Use of error prone abbreviations
  - Sound Alike Look Alike Drugs
  - Lack of patient information

Safety Measures Utilized During Prescribing and Order Processing

- Verify patient information
  - Height/weight, allergies, lab values
- Clarify illegible handwriting
- Utilize technology
  - Computerized Provider Order Entry (CPOE)
  - Dose Range Checking (DRC)
- Be aware of and avoid known error prone abbreviations
- Caution with Sound Alike Look Alike Drugs
- High-alert drugs
- Utilize tall man lettering
**Error Prone Abbreviations**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Sound-Alike Abbreviation</th>
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<tbody>
<tr>
<td>U.S.</td>
<td>U.S.A.</td>
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<tr>
<td>K</td>
<td>Kilo</td>
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<tr>
<td>T</td>
<td>Tall</td>
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<tr>
<td>MG</td>
<td>Milligrams</td>
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**Sound-Alike Look-Alike Drugs (SALAD)**

- Tail - man lettering
- Utilize brand and generic drug name
- Configure computer selection screens to prevent the drug names appearing consecutively
- Change the appearance of the product
- Special auxiliary labeling

**High-Alert Medications**

The Institute for Healthcare Improvement (IHI) defines high-alert medications as:

"...medications that are most likely to cause significant harm to the patient, even when used as intended. Although any medication used improperly can cause harm, high-alert medications cause harm more commonly and the harm they produce is likely to be more serious and leads to patient suffering and additional costs associated with care of these patients."

**Safety Measures Utilized for High-Alert Medications**

- Packaged differently
- Implement double checks
- Auxiliary labeling
- Automated alerts
- Patient education
- Standardizing procedures

**Self Assessment**

Which of the following is **least** likely to result in a wrong dose error?

A. 0.1 U  
B. 10.0 units  
C. .1 mg  
D. 10 mg

**Self Assessment**

You are working at a retail pharmacy and the parents of Aiden, a 4-year-old, are dropping off a prescription. What information should you request from the parents?

A. Weight  
B. Allergy information  
C. Date of birth and insurance information  
D. All of the above
**Preparation and Dispensing**
- The correct medication and dose are prepared and dispensed appropriately for the patient.
- Approximately 11% of medication errors originate during the preparation and dispensing process.
- Common errors:
  - Wrong medication, dose, or dosage form
  - Wrong concentration or diluent
  - Wrong technique – possible contamination
  - Immediate vs extended release products
  - Errors of omission/wrong time
  - Wrong or missing auxiliary labeling

**Safety Measures Utilized in the Preparation and Dispensing Process**
- Technology
  - Automated Dispensing Cabinets (ADCs)
  - Robotic IV preparation devices
  - Pumps and software to manage total parenteral nutrition (TPN) preparations
  - Sterile preparation workflow technology (e.g., Chemocats and DoseEdge)
  - Pneumatic tube medication delivery
- Develop processes which focus on inventory management
  - Sufficient supply
  - Expiration date monitoring
  - Appropriate storage conditions based on manufacturer package insert

**Safety Measures Utilized in the Preparation and Dispensing Process**
- Appropriate staff training and certification for sterile product preparation
- Special precautions for SALAD and high-alert medications
- Separate dosage forms (oral vs topical)
- Standardize concentrations and product inventory
- Purchase ready-to-use (RTU) products when available
- Minimize environmental influences
- Standardize medication administration times

**Administration**
- The medication is administered to the patient as prescribed.
- It is estimated that up to 38% of medication errors are related to administration.
- Common errors:
  - Wrong patient
  - Wrong medication
  - Wrong dose
  - Wrong time or omission
  - Wrong route

**10 Rights of Drug Administration**
- Right Drug
- Right Patient
- Right Dose
- Right Route
- Right Time and Frequency
- Right Documentation
- Right History and Assessment
- Drug Approach and Right to Refuse
- Right Drug-Drug Interaction and Evaluation
- Right Education and Information

**Safety Measures Utilized During the Administration Process**
- Technology
  - Bar Code Medication Administration (BCMA)
  - Automated Dispensing Cabinets (ADCs)
  - Electronic medication administration records
  - Infusion pumps with drug libraries
- Independent double-checks
- Quiet zones during medication administration
- Standard medication administration times
- Patient education and involvement
Effects Monitoring
- Side-effects and adverse drug reactions (ADR)
- Duration of therapy
- Effectiveness of therapy
- Drug levels for medications requiring monitoring
  - Aminoglycosides, antiepileptics, vancomycin, anticoagulants, immunosuppressive agents

Self Assessment
What is an environmental factor that may contribute to a medication error during any step of the medication use process?
A. It is raining outside
B. Multiple interruptions or distractions
C. The paint in the medication room is fluorescent pink
D. There is a full moon

Importance of Reporting Medication Errors
- Identify educational gaps
- Identify the root cause of errors with the goal of improving the medication use system
- Data gathered may assist in identifying priority areas for improvement

Error Detection Methods
- Voluntary Reporting
- Trigger Tools
- Observation
- Chart Review
- Patient Complaint

Reporting Errors
- Institute of Safe Medication Practices (ISMP)
  - National Medication Errors Reporting Program (ISMP MERP)
  - National Vaccine Errors Reporting Program (ISMP VERP)
- Food and Drug Administration (FDA)
  - MedWatch Program
  - Vaccine adverse drug reaction (VAERS)
  - Medical Device Reporting (FDA MDR)
- New Mexico Board of Pharmacy
- The manufacturer of the medication, vaccine, or device
- Internal reporting programs

Self Assessment
While working in the IV room you notice that a few vials of vancomycin have a particulate in the solution. After consulting with the pharmacist in the inpatient area it is decided that all vials from that lot are to be sequestered from working stock. If it is determined that the particulate was not introduced during reconstitution in the IV room, where should this be reported?
A. FDA MedWatch
B. ISMP MERP
C. The manufacturer
D. Any of the above
Person-Based Approach to Errors
- Focus is on human factors
  - Forgetfulness
  - Motivation
  - Carelessness
  - Negligence
- Solutions focus on the specific person involved
  - Disciplinary
  - Blame and shame
  - Legal action

Systems-Based Approach to Errors
- Focus is on system factors
  - Error is the result of the system
  - Every system has the potential for error
- Solutions involve improving the system
  - System-wide barriers and safeguards should be implemented
  - Focus on how and why the system failed – not the individual

Just Culture
“The single greatest impediment to error prevention in the medical industry is that we punish people for making mistakes.”
- Creates an open, fair, and just culture
- Creates a learning culture
- Designs safe systems
- Manages behavioral systems

Self Assessment
You notice that your co-worker is refilling an automated dispensing cabinet but he is by-passing the step that requires the product barcode to be scanned before putting the medication in the machine. You let your co-worker know that the product should be scanned first to help prevent a refill error but he continues to put medications in the machine without scanning. What type of behavior is he exhibiting?
A. Human error
B. At-risk behavior
C. Reckless behavior
D. None of the above

Just Culture
- Human Error
  - Inadvertently doing other than what should have been done
- At-risk behavior
  - Making a choice that increases risk where risk is not recognized or is mistakenly believed to be justified
- Reckless behavior
  - Consciously disregarding a substantial and unjustifiable risk
Conclusion

- The medication use process is complex, comprises multiple steps, and the pharmacy technician is an intricate team member in the process.
- Many medication errors can be prevented by improving processes and systems.
- The pharmacy technician is a valuable member of the healthcare team and uniquely situated to identify process improvement initiatives throughout the medication use system.

Questions?