Medication errors

Medication Errors

Definition of Medication Errors

- A medication error is any preventable event that may cause or lead to inappropriate medication use or patient harm, while the medication is in the control of the healthcare professional, patient, or consumer.
- These errors can occur at any stage in the medication use process.
- **Key Source:**
  - The National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP) defines medication errors comprehensively and provides frameworks for categorizing them.

Types of Medication Errors

Medication errors are classified by the **stage** in which they occur, such as prescribing, transcribing, dispensing, administering, and monitoring.



1. **Prescribing Errors**
   - Errors during the process of selecting a drug, dose, frequency, or route.
   - **Example:** Wrong drug choice, incorrect dose, or incomplete instructions.
   - **Clinical pharmacy involvement:** Evaluate therapeutic appropriateness; check patient-specific factors like renal or hepatic function.
2. **Transcription Errors**
   - Mistakes while transferring prescription information from one source to another (e.g., physician notes to electronic medical record).
   - **Example:** Illegible handwriting leading to incorrect drug entry.

- **Clinical pharmacy involvement:** Promote electronic prescribing systems (e-prescribing) and standard abbreviations.

3. Dispensing Errors

- Errors in the pharmacy when preparing or supplying medication.
- **Example:** Giving the wrong medication, strength, or labeling the product incorrectly.
- **Clinical pharmacy involvement:** Ensure accuracy in labeling, verify high-alert drugs, and supervise pharmacy staff.

4. Administration Errors

- Mistakes that occur when the patient receives the medication.
- **Example:** Wrong dose, wrong time, wrong route, or omission.
- **Clinical pharmacy involvement:** Educate nursing staff; develop administration guidelines; help with protocols like "double-checking" high-risk medications.

5. Monitoring Errors

- Failure to monitor the effects or side effects of a medication.
- **Example:** Not checking INR in a patient on warfarin.
- **Clinical pharmacy involvement:** Design and implement monitoring protocols; follow up on lab values; adjust therapy accordingly.

Causes of Medication Errors

1. Human Factors

- Lack of knowledge, fatigue, distraction, miscommunication.
- Clinical pharmacists can mitigate this through training, checks, and decision-support tools.

2. Systemic Failures

- Poor workflow design, lack of protocols, inadequate staffing.
- Clinical pharmacists advocate for system improvements and quality assurance.

3. Communication Failures

- Between prescriber, pharmacist, and nurse; or between healthcare providers and patients.
- Clinical pharmacists play a key role in bridging communication gaps.

4. Look-Alike/Sound-Alike (LASA) Drugs

- Medications that look or sound similar but have different uses.
- Clinical pharmacists identify these drugs, apply labeling precautions, and educate staff.

5. Abbreviations and Terminology

- Misunderstanding of non-standard abbreviations or unclear handwriting.
- Clinical pharmacists promote use of standardized prescribing formats.

High-Risk Situations and Medications

- Certain drugs have a higher risk of causing harm when used incorrectly.
- **Examples:**
  - Anticoagulants (e.g., warfarin, heparin)
  - Insulin
  - Chemotherapy agents
  - Opioids
  - IV potassium chloride
- **Clinical pharmacists:**
  - Identify high-alert medications.
  - Implement "Tall Man lettering" (e.g., hydrOXYzine vs. hydrALAZINE).
  - Conduct training for healthcare providers.

Detection and Reporting of Medication Errors

Incident Reporting Systems

- Voluntary or mandatory systems used to report medication errors.
- Clinical pharmacists can encourage reporting by ensuring non-punitive culture and confidentiality.

Root Cause Analysis (RCA)

- A systematic process to identify the underlying causes of an error.
- Clinical pharmacists are involved in RCA teams and help develop corrective actions.

Clinical Audits

- Review of prescribing and medication use practices.
- Pharmacists lead or support audits to detect errors and promote safe practices.

Prevention Strategies

A. Education and Training

- For pharmacists, nurses, doctors, and patients.
- Clinical pharmacists provide training on medication safety.

B. Medication Reconciliation

- Comparing a patient's medication orders to all of the medications they have been taking to avoid omissions or duplications.
- Done especially during transitions of care (e.g., admission, discharge).
- Clinical pharmacists play a critical role in this process.

C. Use of Technology

- Computerized physician order entry (CPOE)
- Clinical decision support systems (CDSS)
- Barcode medication administration (BCMA)
- Automated dispensing cabinets (ADCs)
- Clinical pharmacists advocate and oversee these technologies to minimize errors.

D. Standardization of Processes

- Development of standard operating procedures (SOPs), guidelines, and order sets.
- Clinical pharmacists help draft and enforce these standards.

E. Labeling and Packaging Improvements

- Clear and unambiguous labels.
- Avoiding similar packaging for different medications.

Case Examples

Case 1: Dosing Error in Renal Impairment

- A patient with CKD was prescribed a standard dose of aminoglycoside.
- Clinical pharmacist identified the risk of nephrotoxicity.
- Intervention: Dose adjusted based on CrCl, monitoring plan implemented.

Case 2: Drug Interaction Alert Ignored

- A patient on warfarin was started on TMP-SMX, leading to increased INR and bleeding.
- Clinical pharmacist implemented alert system and trained staff on monitoring.

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