Medication Errors

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Objectives
1) Define medication errors/variances
2) Describe common causes and types of medication errors
3) Review the potential impact of medication errors on patients, practitioners, and healthcare institutes
4) Explain the role of the Institute for Safe Medication Practices (ISMP) in preventing medication errors
5) Describe the importance of a non-punitive approach in reporting medication errors
6) Discuss various strategies to prevent medication errors
7) Describe the process of reporting medication errors
8) Explain the meaning and the purpose of root cause analysis
9) Review the steps involved in conducting a root cause analysis
10) Define patient safety and describe how it relates to prevention of medication errors
11) Describe the role of technology in optimizing patient safety
12) List available resources that promote patient safety awareness

Introduction

What is a Medication Error?

According to the National Coordinating Council for Medication Error Reporting & Prevention (NCC MERP)

"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."

Objectives

- Define medication errors/variances
- Describe common causes and types of medication errors
- Review the potential impact of medication errors on patients, practitioners, and healthcare institutes
Prescribing Errors

An error within the prescription itself

- Patient
- Drug
- Dose
- Concentration/Strength
- Dosage Form
- Route
- Frequency
- Rate
- Administration Time
- Duration

Administration Errors

A deviation from the prescription, manufacturer’s administration instructions, or relevant institutional policies during medication administration

- Dose
- Rate
- Route
- Patient
- Time
- Technique
- Preparation
- Drug Stability/Storage

Transcribing Errors

An error that occurs during the translation of a prescription via data entry

Any component of the prescription

Dispensing Errors

A discrepancy between the prescription and the medication that leaves the pharmacy

- Drug
- Dosage Form
- Strength/Concentration
- Diluent
- Volume
- Quantity
- Labeling
- Packaging
- Drug Stability/Storage
- Compounding Error

Causes of Medication Errors

- Communication
- Name Confusion
- Labeling
- Packaging/Design
- Human Factors
- Environmental

Causes of Medication Errors:

Communication

- Verbal
- Written
- Electronic
- Misinterpretation
Causes of Medication Errors:  

**Name Confusion**

- Brand Name
- Generic Name

**"Look-Alike Sound-Alike Drugs"**

Causes of Medication Errors:  

**Human Factors**

- Knowledge Deficit
- Performance Deficit
- Miscalculation
- Computer Error
- Stocking/Restocking/Cart Filling Error
- Drug Preparation Error
- Transcription Error
- Stress
- Fatigue/Lack of Sleep
- Confrontational/Intimidating Behavior

Causes of Medication Errors:  

**Labeling**

- Original Containers
- Dispensed Product
- Package Insert
- Electronic Reference Material
- Printed Reference Material
- Advertising

Causes of Medication Errors:  

**Environmental**

- Lighting
- Noise Level
- Frequent Interruptions/Distractions
- Staffing
- Training
- Floor Stock
- System for Covering Patient Care
- Policies & Procedures
- Communication Systems Between Healthcare Practitioners
- Preset Medication Orders

Causes of Medication Errors:  

**Packaging/Design**

- Inappropriate Packaging/Design
- Dosage Form Confusion
- Equipment

Impact on Healthcare Institutes & the Economy

- Medical errors cost the U.S. $19.5 billion/year
  - $17 billion associated with additional medical costs
- $1.4 billion attributed to increased mortality rates
  - $1.1 billion or 10 million days of lost productivity
  - Loss of $735-$980 billion/year in quality-adjusted life years

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Impact on Healthcare Practitioners

- Punitive Consequences
  - Probation
  - Suspension
  - Termination
  - Criminal Prosecution
- Emotional Consequences
  - Sleep Loss
  - Lack of Job Confidence
  - Anxiety
  - Embarrassment
  - Guilt
  - Remorse

Impact on Patients

- More than 1 in 5 people in the US been affected by a medical error in some way
- 1.5 million patients experience preventable medical errors: 200,000 deaths per year

Medication Error Reporting

- Institute for Safe Medication Practices (ISMP)
- United States Pharmacopeia (USP)
  - Medication Errors Reporting (MER) Program
  - MedMARX
- The Food and Drug Administration (FDA)
  - MedWatch

Objectives

- Describe the importance of a non-punitive approach in reporting medication errors
- Explain the role of the Institute for Safe Medication Practices (ISMP) in preventing medication errors
- Discuss various strategies to prevent medication errors

Taking a Non-Punitive Approach

- Reporting of medication errors is necessary, including near miss-events
- Data can only be utilized if it is collected
- To Err is human
  - Improving the pharmacy system
- A standardized reporting system must be balanced
  - Both confidential and non-punitive
Institute for Safe Medication Practices (ISMP)
- Nonprofit organization devoted entirely to medication error prevention
- Collaboration with practitioners, organizations, and drug manufacturers

Medication Errors Reporting Program (MERP)
- National reporting program
- Non-punitive approach
- Root-cause analysis
- Public information regarding medication error prevention
  - Nationwide Hazard Alerts
  - Error Prone Trends
  - National Safety Guidelines

Strategies to prevent medication errors
- Recommendations for preventing medication errors
- Organizational and Departmental
  - Prescribers
  - Pharmacists
  - Nurses
  - Patients

Medication Safety Resources
- Medication Safety Resources
  - Do not crush list
  - High alert medication list
  - Confused drug name list
  - Error prone abbreviation list
- ISMP Medication Safety Alert
  - Healthcare providers
  - Patients
- Educational Programs/ Resources
  - Teleconferences and continuing education courses
  - Posters, videos, patient brochures, textbooks

Organizational and Departmental Recommendations
Provide policies, procedures, protocols to ensure safe medication practices and minimize medication errors
- Workforce and workplace environment
- Drug utilization/ P&T Committee
- Medication administration

Organizational and Departmental Recommendations
- Workforce considerations
  - Hiring, assigning, and staffing considerations
  - Training and continuous review
- Workplace environment conditions
  - Pharmacy layout should provide adequate space
  - Special bins and labeling for high-alert medications
  - Routine inspection
Organizational and Departmental Recommendations

- Healthcare provider resources
  - Automated systems
    - Checking for doses, duplications, allergies, drug-drug interactions
    - High-alert distinction to decrease alert fatigue
  - Current drug information resources
- Protocols and references
  - Standard drug concentration and IV dilution charts
  - Approved abbreviations lists
  - Treatment algorithms

Right Patient, Drug, and Dose

- Use two patient identifiers
- Assess and maintain patient medication profile
- Communicate with providers
- Observe patient medication boxes and medication administration
- Provide special instructions when needed

Organizational and Departmental Recommendations

- Ensuring timely medication delivery and administration
  - Standard drug administration times & procedures
  - Medication tracking procedures
  - Returned medication procedures
- Transitions of care
  - Home medication policies
  - Medication reconciliation policies
  - Floor/ward transfer policies
  - Discharge medication procedures & counseling

Right Route and Time

- Communicate with providers and patients regarding PO status
- Verify use of medication
- Utilize standard administration times
- Avoid BID or TID for medications that should be scheduled Q8H or Q12H
- Avoid delays in care

Recommendations for Pharmacists

The “Five Rights”

- Right Patient
- Right Drug
- Right Dose
- Right Time
- Right Route

Recommendations for Pharmacists

- Further education
- Be available as a medication expert
- Intervene when necessary
- Report medication errors!
Objectives

- Describe the process of reporting medication errors
- Explain the meaning and the purpose of root cause analysis
- Review the steps involved in conducting a root cause analysis

Reporting Errors

"Those who cannot remember the past are condemned to repeat it" ~ George Santayana

Reporting to Organizations that Specialize in Error Prevention

The Patient Safety & Quality Improvement Act of 2005
- Authorized the creation of Patient Safety Organizations (PSOs)
- Encourages clinicians and health care organizations to voluntarily report

Importance of Reporting Errors

- Important public health benefit to alert other healthcare professionals so that it can be prevented from happening to other patients
- Events may go unrecognized; important epidemiological and preventive information would be unavailable

Error Reporting Organizations

- FDA MedWatch program
- ISMP Medication Errors Reporting Program (MERP)
- Veterans Affairs Adverse Drug Event Reporting System (VAADERS)
Who is Responsible for Reporting?

- Everyone associated with healthcare:
  - Pharmacists
  - Physicians
  - Nurses
  - Dentists
  - Technicians
- Most medication errors are reported by pharmacists and nurses

What Information to Report?

NEVER include:
- Opinions
- Conclusions
- Criticism
- Accusation
- Admissions
- Patients' names

When to Report?

Immediately report an event whether or not it may cause serious harm

Root Cause Analysis

What is Root Cause Analysis (RCA)?

- A retrospective investigation of an event that has already occurred
- Information obtained is used to design changes that will prevent future error
- Should be conducted for every sentinel event

Sentinel event: an unexpected occurrence involving death/serious physical/psychological injury, or the risk thereof
RCA Model:

- Focus is on PREVENTION, not blame/punishment
- Focus on SYSTEM level vulnerabilities, not individual performances
- Targeting corrective measures at the identified root cause is the best way to prevent similar problem from reoccurring

Purpose of Conducting RCA

Identify changes that can be made in the systems through:
- Re-design
- Developing new process
- Equipment
- Approaches that will reduce the risk or the error/close call reoccurring

Steps For Conducting A RCA

Step 1: Team members:
- Team leader
- An individual with knowledge about the event
- Frontline worker familiar with process
- Optional: RCA expert

Step 2: Determine what happened
- When did the event occur?
- What are the details of the event?

Step 3: Flowchart of the event
- What was the actual sequence of events?
- What events were involved or contributed to the event?
- Ask why at each step to identify any contributing or root causes

*important because it can help uncover unknown gaps*

Steps For Conducting A RCA

1) Establish the RCA team
2) Describe event in detail
3) Flowchart steps that led to the event
4) Identify the Root Cause
5) Develop an action plan
6) Develop outcome measures
Steps For Conducting A RCA

- **Step 4: Identify Root Causes**
  Each root cause should be considered for an action and addressed in the action plan

- **Step 5: Develop an action plan**
  Formulate improvement actions for each identified root cause

- **Step 6: Establish measures**
  Methods to measure effectiveness of the action plan over time

Prospective Option

- RCA can be considered as a repetitive process and is frequently viewed as continuous quality improvement (CQI) tool

- **Failure Mode and Effects Analysis (FEMA)**
  Proactive method used to reduce the frequency and consequences of errors
Objectives

- Define patient safety and describe how it relates to the prevention of medication errors
- Describe the role of technology in optimizing patient safety
- List the available resources that promote patient safety awareness

Patient Case

- Mr. Joe Smith had a past medical history of alcoholism, cirrhosis, hypertension, and falls
- Admitted inpatient to team 4
- Uncontrolled hypertension upon admission
- Team increased furosemide and spironolactone
- During rounds, the team decided to discharge the patient with new dose of furosemide and spironolactone
- Placed outpatient orders with new dose of medications

Patient Safety

Definition

- According to the World Health Organization (WHO), patient safety is a fundamental principle of healthcare
- Every point in the process of care-giving contains a degree of inherent unsafety
- Adverse events may result from problems in practice, products, procedures, or systems

Patient Case

- After rounds and further discussion about the patient, the team changed their mind and decided to go back to home dose
- An addendum was made stating their decision
- They did not discuss this with pharmacy, put in a new order, or alert pharmacy with their addendum
- The patient was counseled and discharged with the new doses of medication
- Two days later, the patient was re-admitted for a fractured hip from a fall

Prevention: Swiss Cheese Model

Patient Case

- The patient stated it was the medications that made him dizzy which resulted in his fall
- The patient blamed the doctor but the doctors pointed at the addendum and blamed pharmacy
- There was not a single cause but a combination of factors
- This is an example of a Swiss cheese model
- Lines of communication were lost, multiple systems errors occurred, and patient safety was compromised
Omission Error

- Failure to complete an action
- Patient case example:
  - Pharmacy fails to have a medication to the floor on time
  - Nursing does not have a medication for a patient readily available for the prescribed administration time
  - Nurse completes a missing dose request to pharmacy
  - Pharmacy fulfills missing dose but nurse does not administer the medication

Commission Error

- Completing an act incorrectly
- Patient case example:
  - Pharmacy fails to have a medication to floor on time
  - Nursing does not have a medication for a patient readily available for the prescribed administration time
  - Nurse does not complete missing dose request to pharmacy
  - Nurse instead uses another patient’s medication to give to patient at designated administration time

Prevention:

**Five Rights of Medication Safety**

- Five rights
  - Right drug
  - Right dose
  - Right route
  - Right patient

- Should be completed by every health care professional for every patient for each medication administration

Role of Technology:

**Lack of Oral/Written Communication**

Barriers within healthcare providers vs healthcare provider to patient

- Time constraints
- Inability to contact healthcare professional/patient
- Lack of understanding
- Inadequate training
- Relationship barriers
- Environmental obstacles

Role of Technology:

**Computerized Physician Order Entry**

Electronic entry of medical practitioner’s instructions and medications

- Decreases medical errors and cost
  - Study completed at Brigham and Women’s hospital displayed that it decreased errors by 55% in one year
- Increased accuracy and efficiency
  - Automatically assesses drug-drug interactions and possible contraindications
- System’s safety net in place to ensure all information is correctly entered

Role of Technology:

**Bar Code Administration**

Scanning technology to ensure right patient and right medication

- Increased medication administration accuracy and efficiency
  - Will not allow other medications to be delivered
  - Helps eliminate human error
- Online medication administration documentation
  - Can be accessed by any healthcare provider from any location to ensure patient has received medication
- Patient specific instructions can be flagged
Role of Technology: System’s Error

Technology flaws within the hospital computer system
- Outdated
  - Requires time and skill to update programs
- System function error
  - Technology is not always reliable
  - Can have an error communicating between systems
- Lack of training
  - Medication orders can be placed incorrectly
- Unforeseen gap in system safety protocol
  - Technology does not replace gaps in knowledge or skill

Available Resources: The Joint Commission
- Independent organization that provides accreditation to over 17,000 health care organizations
- Ensures the highest quality of care and standards for patient safety
- On-site survey every 3 years
- National patient safety goals (NPSGs) are set annually for specific types of health care settings and “Elements of Performance” must be met
- Pharmacists can focus on detailed medication related NPSG
- Pharmacy Specific National Patient Safety Goal Example:
  - NPSG 03.03.01 Reduce the likelihood of harm associated with anticoagulant therapy

Role of Technology: Pharmacy Dispensing Systems

- Automated dispensing cabinet (ADC)
  - Accountability for medications
  - Wrong drug selected
  - Wrong dose
  - Errors from overrides
  - Stocking error
- Patient Controlled Analgesic Device
  - Provides optimal patient specific pain control
  - Allows patient to treat pain quickly
  - No health care provider needed
  - Provides patient immediately with right drug and dose
  - Reduces side effect profile

Available resources: American Society of Health-System Pharmacists

ASHP: Patient Resource Center
- Purpose of the ASHP Resource Center on the Patient Safety is to foster fail-safe medication use in health systems through the leadership of pharmacists
- The center fulfills its mission through advocacy, education, and research
- Report medication error
- Report an adverse event/safety issue

Available Resources: Patient Safety Awareness

- WHO: Multi-professional Patient Safety Curriculum Guide
- American Medical Association: Patient Safety Resources
- National Patient Safety Foundation
- The Joint Commission
- ASHP: Patient Safety Resources
- Institute for Safe Medication Practices
- Food Drug Administration
- Agency for Healthcare Research and Quality

Available Resources: Institute for Safe Medication Practices

- Education and Awareness
  - Newsletters
  - Consulting Services
  - Educational programs
  - Self-Assessments
  - Professional Development
  - ISMP Guidelines
  - Quarterwatch
- FDA medication safety alerts
- FDA medication safety videos
- Medication safety tools and resources
Questions???

- Due to the implementation of electronic order entry, illegible handwritten prescriptions are no longer a cause of medication errors.
- Root cause analysis focuses on the healthcare providers responsible for causing the medication error.
- A medication error is any unpreventable event that may cause or lead to inappropriate medication use or harm to a patient.

References