Medication Events: An Introduction

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# Objectives

By the end of this presentation, the participant should be able to:

- – Define the difference between medication errors and adverse drug events
- – Review some of the potential reasons for medication events
- – Understand that medication errors are common, but can be prevented

Unsafe Medication Practices Result in Medication Errors and Adverse Events

Otero MJ, Schmitt E. *Ann Intern Med.* 2005;142(1):77.
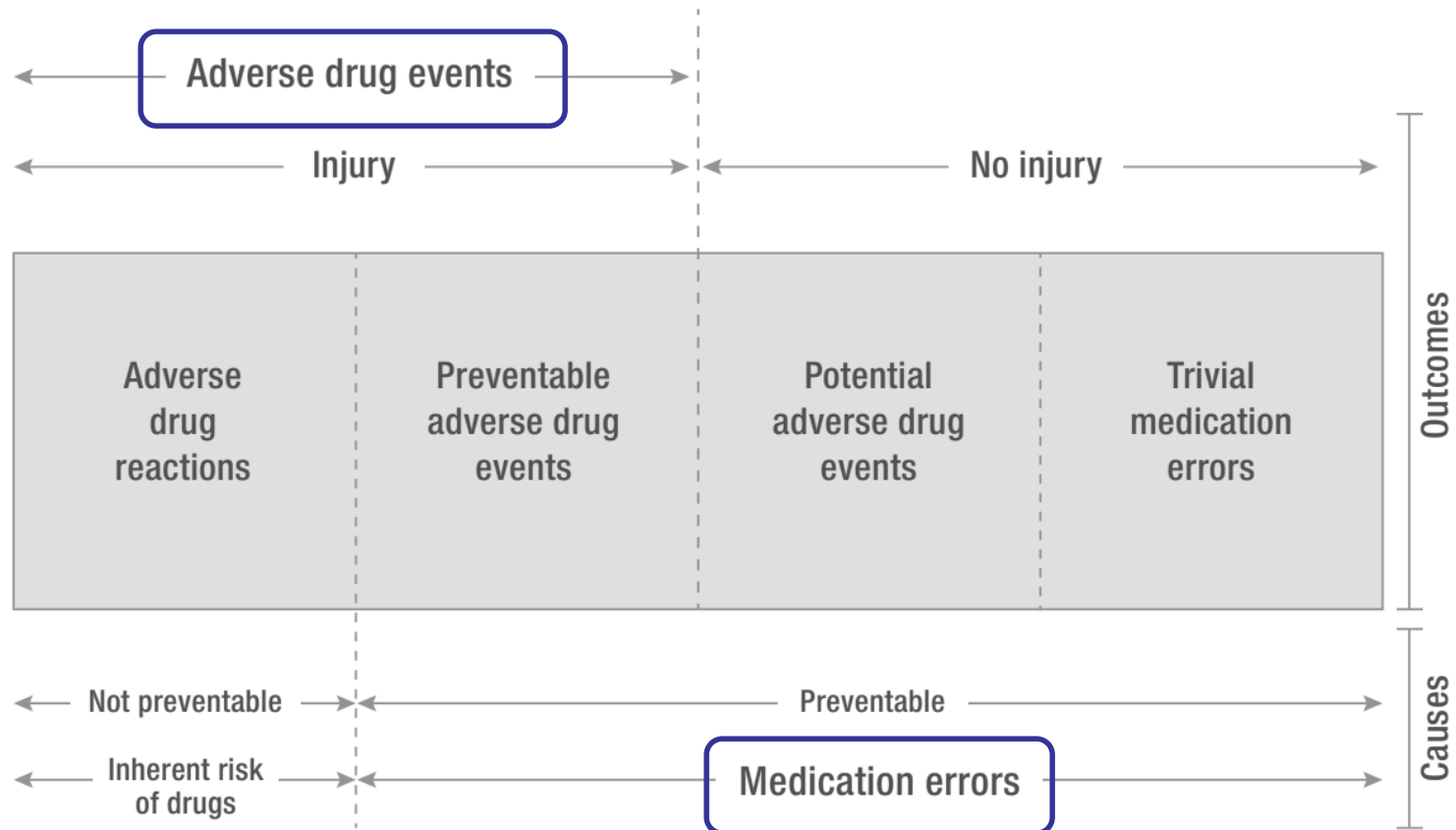
Medication Safety Events
Medication Error vs. Adverse Event

Medication errors	Adverse drug reactions
• Preventable and associated with inappropriate drug use • Prevented through improvements in the medication use system	• NON-preventable injuries that result from the intrinsic properties of the drug itself • Prevented by reduction in exposure to drugs and use of less hazardous alternatives

Otero MJ, Schmitt E. *Ann Intern Med.* 2005;142(1):77.

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Medication Errors are Common

- Medication errors and unsafe medication practices are a leading cause of preventable harm across the world

- Estimated annual cost from medication errors is about $42 billion USD

- Patients in low-income countries experience 2X as many disability-adjusted life years lost due to medication-related harm than those in high-income countries

Medication Without Harm - Global Patient Safety Challenge on Medication Safety. Geneva: World Health Organization, 2017. Licence: CC BY-NC-SA 3.0 IGO. https://apps.who.int/iris/bitstream/handle/10665/255263/WHO-HIS-SDS-2017.6-eng.pdf?sequence=1

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To Err is Human

- Published in 1999 by the Institute of Medicine
  - About 100,000 people die every year in the US from medical errors
  - This number affected is likely much higher
- Set the tone and agenda for improving patient safety by designing a stronger, safer healthcare system
- Overarching theme:
  - *How can we learn from our mistakes?*
- Recommendations to reduce error were PHARMACY HEAVY

Institute of Medicine (US) Committee on Quality of Health Care in America; Kohn LT, Corrigan JM, Donaldson MS, editors. Washington (DC): National Academies Press (US); 2000.

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To Improve: Know the Problem!

Weak medication systems

- Prescribing
- Transcribing
- Dispensing
- Administration (most common)
- Monitoring

Human factors

- Fatigue
- Poor environmental conditions
- Staffing shortages

Medication Without Harm - Global Patient Safety Challenge on Medication Safety. Geneva: World Health Organization, 2017. Licence: CC BY-NC-SA 3.0 IGO. https://apps.who.int/iris/bitstream/handle/10665/255263/WHO-HIS-SDS-2017.6-eng.pdf?sequence=1

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To Err is Human
Selected Recommendations

- Adopt system-oriented approach to med error reduction
- Implement standard processes for medication doses, dose timing, and dose scales in a given patient care unit
- Standardize prescription writing and prescribing rules
- Implement physician order entry, pharmaceutical software, clinical decision support
- Implement unit dosing
- Use special procedures and protocols for high-risk meds
- Do not store concentrated solutions of hazardous medications on patient care units
- Include a pharmacist during rounds of patient care units
- Improve patients' knowledge about their treatment

Institute of Medicine (US) Committee on Quality of Health Care in America; Kohn LT, Corrigan JM, Donaldson MS, editors. Washington (DC): National Academies Press (US); 2000.

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Medication Safety Resources

- **Agency for Healthcare Research and Quality (AHRQ)**

- **The Joint Commission (TJC)**
  - Patient Safety Goals

- **World Health Organization**
  - *Medication Without Harm*

- **Institute for Safe Medication Practices (ISMP)**
  - Error-Prone Abbreviations
  - Confused Drug Names (LASA/Look-Alike-Sound Alike List)
  - TALLman Lettering
  - High Alert Medications
  - Medication Safety Best Practices

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Error Prone Abbreviations – Examples

Abbreviations	Intended	Misinterpretation	Correction
μg	Microgram	Mistaken as "mg"	Use "mcg"
cc	Cubic centimeters	Mistaken as "u" (units)	Use "mL"
IU	International unit	Mistaken as IV (intravenous) or 10 (ten)	Use "units"
o.d. or OD	Once daily	Mistaken as "right eye" (OD-oculus dexter), leading to oral liquid medications administered in the eye	Use "daily"
q.o.d. or QOD	Every other day	Mistaken as "q.d." (daily) or "q.i.d. (four times daily) if the "o" is poorly written	Use "every other day"
q1d	Daily	Mistaken as q.i.d. (four times daily)	Use "daily"

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Confused Drug Names – Examples

Consider using TALLman lettering (ALL CAPS for differing part of the drug name), brand + generic names, or other mechanisms to differentiate products

Drug Name	Confused Drug Name
Adacel (Tdap)	Daptacel (DTaP)
ALPRAZolam	LORazepam
amphotericin B liposomal	amphotericin B
azaCITIDine	azaTHIOprine
carBAMazepine	OXcarbazepine
CARBOplatin	CISplatin
DACTINomycin	DAPTOmycin
DAUNOrubicin	DOXOrubicin
diphenhydramine	dimenhyDRINATE

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High Alert Medications – Examples

Classes/Categories of Medications
Adrenergic agonists, IV (e.g., EPINEPHrine, phenylephrine, norepinephrine)
Anesthetic agents, general, inhaled and IV (e.g., propofol, ketamine)
Antiarrhythmics, IV (e.g., lidocaine, amiodarone)
Antithrombotic medications
Chemotherapeutic agents, parenteral and oral
Concentrated electrolytes (magnesium sulfate, potassium phosphates, etc)
Dextrose, hypertonic, 20% or greater
Neuromuscular blocking agents (e.g., succinylcholine, rocuronium, vecuronium)
Sterile water for injection, inhalation and irrigation (excluding pour bottles) in containers of 100 mL or more

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Medication Safety Best Practices

- Targeted for inpatient hospitals, updated every 2 years

- **Examples in 2020 – 2021 recommendations**
  - VinCRIStine (and other vinca alkaloids) inadvertently administered by the intrathecal route
  - Accidental daily dosing of oral methotrexate intended for weekly administration
  - Accidental administration of an intravenous infusion of sterile water
  - Errors during sterile compounding of medications
  - Serious tissue injuries and amputations from injectable promethazine use

https://www.ismp.org/guidelines/best-practices-hospitals

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Steps to Improving Safety

- **Perform a baseline assessment of need**
  - Use readily available tools and checklists
    - Key driver diagrams, Fishbone diagrams
  - Understand the context and local need

- **Prioritize improvement processes**
  - Evaluate results from Root Cause Analyses
  - Perform Failure Modes Effects Analysis
  - Identify achievable change

- **Follow quality improvement methodology**
  - Refer to future slides

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Medication Safety Events: Key Points

1. Weak medication systems and human factors may both be responsible for medication errors

2. Pharmacists may play a critical role in preventing medication error by strengthening medication systems

3. A variety of medication resources are readily available for use

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What's Next?

- Take the practice quiz

- Answer the practice questions

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