Preventing Disasters in Your Practice
Medication Errors

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Financial Disclosures

I do not have any relevant financial disclosures.
Outline

Medication Errors

• Definitions
• Outpatient Data
• Medication Errors
  • Prescribing
  • Dispensing
  • Administering
  • Monitoring
• Summary
• Audience Response Questions
Educational Objectives

Medication Errors

• Describe the importance of medication errors in regards to patient safety and healthcare cost
• Describe methods to decrease prescribing errors
• Identify abbreviations to avoid when prescribing or documenting medications
• Identify look-alike and sound-alike medications in dermatology
• List examples of medication errors and several ways to avoid them in your practice
Medication Errors
Medication Error

Definition

National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP):

"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 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."
**Terminology**

*Medication Error:* Inappropriate use of a drug that may or may not result in harm

*Adverse Drug Event (ADE):*
  - Medication error resulting in harm

*Potential Adverse Drug Event:*
  - Medication error that poses a significant risk but does not cause harm
  - Near miss or close calls
Medication Errors

Why do we care?

• Cause at least one death every day
• Injure approximately 1.3 million people/year
• $3.5 billion in excess medical costs/year for ADEs

https://www.cdc.gov/medicationsafety/basics.html
https://www.fda.gov/Drugs/DrugSafety/MedicationErrors/ucm080629.htm
Medication Errors

*How often do they happen?*

- Most data is from inpatient setting
  - 380,000 to 450,000 preventable ADEs occurred annually in United States hospitals

- Lacking outpatient data
  - Difficult to monitor, reporting not as organized, unreported asymptomatic medication errors

Medication Errors

*How often do they happen?*

- 4 adult primary care practices
- Reviewed 1879 prescriptions
- 7.6% to have at least 1 error

Medication Errors

Computerized Prescribing

How often do they happen?

• 3850 outpatient computerized prescriptions received at a commercial pharmacy chain in 3 US states
• 11.7% prescriptions had 466 errors
• 4.2% of prescriptions had potential ADEs
  • 58.3% were significant
  • 41.7% were serious
  • 0 were life threatening

Nanji KC, Rothschild JM, Salzberg C, et al.
Medication Errors

Computerized Prescribing

• Most common cause for error
  • Omitted information
    • 60.7% total errors
    • 50.9% of potential ADEs
    • Most likely information to be omitted: Duration, dose, or frequency
• Most likely to result in potential ADE
  • Omitted dose
    • 35% of potential ADEs
• Other causes of error: unclear, conflicting, or clinically incorrect

Nanji KC, Rothschild JM, Salzberg C, et al.
Classes of Medications Associated with Prescribing Errors

• *Prescription Errors:*
  • Anti-infective 40.3%
  • Nervous-system drugs 13.9%
  • Respiratory-system drugs 8.6%

• *Prescription Errors associated with potential ADEs:*
  • Nervous-system drugs 27%
  • Cardiovascular 13.5%
  • Anti-infective 12.3%

Medication Errors

Computerized Prescribing

Are all computerized prescribing systems equal?

• Medication Errors:
  • 5.1% to 37.5% depending on computerized system used
  • Each computerized system had different types of errors

Nanji KC, Rothschild JM, Salzberg C, et al.
Medication Errors

Why are they happening?

• 149 errors occurring in 93 transplant patients over 12 months
  • 32% ADEs
  • 13% severe and required hospitalization or outpatient invasive procedures

• Error Types
  • Patient errors 56%
  • Prescription errors 13%, Delivery errors 13%, Availability errors 10%, Reporting errors 8%

• Root cause analysis:
  • Patients: 68%
  • Pharmacies and healthcare team: 27%

Friedman AL, Geoghegan SR, Sowers NM, Kulkarni S, Formica RN Jr.
Medication Errors

• Prescribing
• Dispensing
• Administration
• Monitoring
Medication Errors
Prescribing
Prescribing Errors

Miscommunication or Misinterpreted prescriptions:
- Illegible handwriting
- Misused abbreviations
- Look alike sound alike drugs
- Unclear or confusing instructions “as directed”
- Incomplete Prescriptions: Omitted Information (drug, dose, frequency)

Incorrect Prescriptions
- Incorrect drug, dose, frequency

Drug not appropriate for patient
- Drug interactions
- Allergies
- Pregnancy and breastfeeding status
Computerized Prescribing Errors

• Prescription for incorrect patient
• Information entered incorrectly or not entered into electronic medical record
  • Drug interactions
  • Missed allergies
• Prescriptions being transmitted when canceled or voided
• Poor interface with pharmacy
How do I avoid prescribing medication errors in my practice?
Prescribing Medication Errors

Recommendations

- Handwriting legible or use computerized prescribing
- Avoid using abbreviations
- Be aware of look-alike and sound-alike medications
- Be aware of drop downs for prescribing
- Add an indication for the prescription “for psoriasis”
- Avoid allowing medical staff to send in electronic prescriptions
- Ensure computerized prescribing system is mature and works well with pharmacy
- Double check the prescription
  - Correct patient, medication, dose, route, duration
  - Verify allergies
  - Verify no drug interactions
  - Verify pregnancy and breast feeding status
## “Do Not Use” List for Medication Prescriptions, Orders, and Documentation

<table>
<thead>
<tr>
<th>Do Not Use</th>
<th>Potential Problem</th>
<th>Use Instead</th>
</tr>
</thead>
<tbody>
<tr>
<td>U, u (unit)</td>
<td>Mistaken for:</td>
<td>Write “unit”</td>
</tr>
<tr>
<td></td>
<td>• “0” (zero)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• “4” (four)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• “cc”</td>
<td></td>
</tr>
<tr>
<td>IU (international unit)</td>
<td>Mistaken for:</td>
<td>Write ”international unit”</td>
</tr>
<tr>
<td></td>
<td>• IV (intravenous)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• ”10” (ten)</td>
<td></td>
</tr>
<tr>
<td>Q.D, QD, q.d, qd</td>
<td>Mistaken for:</td>
<td>Write “daily”</td>
</tr>
<tr>
<td>Q.I.D, QID</td>
<td>• Each other</td>
<td>Write “every other day”</td>
</tr>
<tr>
<td></td>
<td>• Period after the Q</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• “O” mistaken for “I”</td>
<td></td>
</tr>
<tr>
<td>Trailing zero (X.O mg)</td>
<td>• Decimal point is missed</td>
<td>Write X mg</td>
</tr>
<tr>
<td>Lack of leading zero</td>
<td>• Decimal point is missed</td>
<td>Write 0.X mg</td>
</tr>
<tr>
<td>(.X mg)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Joint Commission 2004
Look-alike and Sound-alike Medications

What can I do to avoid this type of error?

• Think outside of dermatology
• Minimize the use of verbal and telephone orders
• Use brand and generic names on prescriptions and labels
• Include the indication on the prescription “for psoriasis”
• Configuring computer selection screens to prevent look-alike names from appearing consecutively
• Changing look-alike medication names to draw attention to their dissimilarities
  • TALL man (mixed case) letters

Institute of Safe Medication Practices
Look-alike and Sound-alike Medications

<table>
<thead>
<tr>
<th>Examples of Dermatology Medications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aldara</td>
</tr>
<tr>
<td>azaTHIOPrine</td>
</tr>
<tr>
<td>Carac</td>
</tr>
<tr>
<td>cetirizine</td>
</tr>
<tr>
<td>cycloSPORINE</td>
</tr>
<tr>
<td>Humira pen</td>
</tr>
<tr>
<td>hydrOXYzine</td>
</tr>
<tr>
<td>rifampin</td>
</tr>
<tr>
<td>Soriatane</td>
</tr>
<tr>
<td>ZyrTEC</td>
</tr>
</tbody>
</table>

FDA approved and ISMP recommended TALL man (mixed case) letters
Computerized Prescribing

*How can I avoid medication errors?*

- Medication reconciliation
- Verify name and date of birth before entering an order
- Review all new medications and intended use with the patient
- Follow up with a phone call to the pharmacy when a prescription is canceled or changed
- Feedback to the vendor for future upgrades
Computerized Prescribing

Desirable Features

• “Forcing Functions”
  • Will not allow finalizing of prescriptions with incomplete drug name or dosage, unspecified “as needed” directions, and inappropriate abbreviations

• Specific drug decision support
  • Automated maximum dose checking and alerts

• Calculators
  • Automatic quantity calculation based on dosage and duration entries

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Medication Errors

Dispensing Errors
Prescribing propranolol for infantile hemangioma: Assessment of dosing errors

- Generic propranolol hydrochloride oral solution: 4 mg/mL and 8 mg/ml
  - Prescribers noted pharmacy dispensing errors: higher concentration 8 mg/mL, with a potential risk of overdose in this infant population
    - At least 1 dispensing error reported by 18% of physicians
  - Dose calculations
    - 30% at least 1 dose calculation error
- Hemangeol: 4.28 mg/mL
  - Specialty pharmacy
  - Standardized dosing, dosing chart
    - 11% at least 1 dose calculation error

How can I avoid dispensing errors?

• Be aware of dispensing errors
  • Medications available in different concentrations
• Educate our patients.
  • Ask the patient to verify the correct dose on the medication
Medication Errors
Administering Errors
Medication Errors
Administering Errors

- In-office injections
- Patients administer medications
Medication Errors

Administration Errors: In Office Injections

- WHO
  - 2010 infections from unsafe injections:
    - 33,800 HIV, 1.7 million hepatitis B, 315,000 hepatitis C
    - 16 billion injections are administered worldwide
  - Other errors associated with injection use include:
    - Incorrect patient, Allergies
    - Mistakes in weight-dependent dosing
    - Incorrect reconstitution (wrong concentration or inappropriate diluent)
    - Wrong route of administration
    - Incorrect storage
    - Using single-dose vials as multi-dose vials
Multi-dose Vials

• **What is it?**
  • Labeled as *multi-dose*
  • Typically contain antimicrobial preservative
  • *Does not protect against viruses or contamination*

• **Can be used for more than 1 patient?**
  • 1 patient if possible
  • If 1+ patients, keep and access in a dedicated medication preparation area, away from immediate patient treatment areas

• **When should a multi-dose vial be discarded?**
  • Whenever sterility is compromised or questionable
  • *Discarded within 28 days of opening* unless manufacturer specifies different date
What can I do to prevent medication administration errors associated with injections?

- Practice safe in office injections, avoid contamination
- Use single dose-vials once and discard
- Label multi-dose vials and discard within 28 days of opening
- Verify correct patient and allergies
- Two members confirm medication dosages before administration
- Repeating and confirming verbal medication requests before administration
- Posting quiet zone signage in medication preparation areas
Medication Errors

Patients Administer Medications
Medication Errors

Patients Administer Medications

• **Factors that contribute to medication errors:**
  - Patient characteristics (personality, literacy, language barriers)
  - Multiple medical problems, polypharmacy, high risk medications

• **Examples of medication errors:**
  - Taking methotrexate daily instead of once a week
  - Using clobetasol on their eyelids
  - Using the cream you gave them for hand dermatitis (clobetasol) on tinea pedis
  - Restarting doxycycline when taking isotretinoin
How can I avoid Medication Errors associated with patients in my practice?

• Educate the patient
• Consider writing out instructions or creating a handout explaining how to use or take a medication
• Follow-up with the patient to ensure proper use
• Recommend your patients bring their medications with them to their visit
• Medication reconciliation
Medication Errors

*Pediatrics*

- A small error in dose of medication has a greater risk of harm compared to the adult population.
- Requires weight-related dose adjustment
- Liquid medication more common
- > 40% caregivers make errors when dosing liquid medication

*How can I minimize caregiver administration error?*

- Use mL instead of teaspoon or tablespoon, use a syringe
- Educate the care giver
Medication Errors
Medication Monitoring
How do I avoid medication errors associated with monitoring in my practice?

• Develop or follow existing best practices for prescribing and monitoring
• Have safeguards in place to ensure such guidelines are followed
Medication Errors

Where to Report

• FDA MedWatch
  • [https://www.fda.gov/Safety/MedWatch/default.htm](https://www.fda.gov/Safety/MedWatch/default.htm)
  • (800) 332-1088

• Institute for Safe Medication Practices
  • [www.ismp.org](http://www.ismp.org)
  • (215) 947-7797

• U.S. Pharmacopeia
  • [www.usp.org](http://www.usp.org)
  • (800) 23-ERROR (233-7767)

• MedMARX
  • [http://www.medmarx.com](http://www.medmarx.com)
  • Used by hospitals, not submitted to FDA
Medication Errors

*Summary*

- Harmful to patients
- Expensive
- Can be prevented
- Need more data for outpatient medication errors
  - ADEs will increase
    - Aging population on multiple medications
    - New medications
How to I prevent medication errors in my practice?

Summary

- Verify correct patient, drug, route, and dose
- Medication Reconciliation
- Confirm allergies and ensure updated in chart
- Verify no significant drug interactions
- Confirm pregnancy and breastfeeding status
- Double check
- Consider adding an indication for the medication
- Do not allow medial assistants or other support staff to send in electronic prescriptions
- If you cancel or modify a prescription, consider calling the pharmacy to verify
- Educate our patients
- Follow-up with our patients
- Follow monitoring guidelines, standardize monitoring
Question #1:
When do medication errors occur?

A. Prescribing
B. Dispensing
C. Administering
D. Monitoring
E. All of the above
Question #1:  
When do medication errors occur?

A. Prescribing  
B. Dispensing  
C. Administering  
D. Monitoring  
E. All of the above
Question #2: Where can I report a medication error?

A. FDA MedWatch

B. Institute for Safe Medication Practices

C. U.S. Pharmacopeia

D. Do not report

E. A, B and C
Question #2:
Where can I report a medication error?

A. FDA MedWatch

B. Institute for Safe Medication Practices

C. U.S. Pharmacopeia

D. Do not report

E. A, B and C
Question #3: When should you discard multi-dose vials?

A. When they are completely used

B. 28 days after opening unless manufacturer specifies other date

C. 45 days after opening unless manufacturer specifies other date

D. 7 days after opening unless manufacturer specifies other date

E. 1 day after opening unless manufacturer specifies other date
Question #3: When should you discard multi-dose vials?

A. When they are completely used

B. 28 days after opening unless manufacturer specifies other date

C. 45 days after opening unless manufacturer specifies other date

D. 7 days after opening unless manufacturer specifies other date

E. 1 day after opening unless manufacturer specifies other date
Thank-you!

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