# High Risk Medications in the Hospital Pharmacy

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## Conflict of Interest Declaration

- None to disclose

## Learning Objectives

- Recognize high risk medications in the health-system pharmacy environment
- Describe what makes a drug high risk
- Discuss medical outcomes related to adverse drug events
- Explain strategies to prevent or minimize medication errors involving high risk medications

## According to The Joint Commission…

"Medication errors are one of the most common causes of avoidable harm to patients in health care organizations"

The Joint Commission. High-Alert Medications and Patient Safety. Available at: http://www.jointcommission.org/sentinelevents/sentineleventalert/sea_11.htm. Accessed July 25, 2010.

## Institute of Medicine *Preventing Medication Errors*

- 1.5 million preventable adverse drug events occur each year in the United States
- 400,000 adverse drug events that occur in hospitalized patients result in $3.5 billion in additional costs

Committee on Identifying and Preventing Medication Errors. Aspden P, Wolcott J, Bootman JL, Cronenwett LR, Editors. *Preventing Medication Errors: Quality Chasm Series.* Washington, DC: National Academies Press; July 2006.

## Medication Safety Organizations

- Institute for Safe Medication Practices (ISMP)
- The Joint Commission
- FDA MedWatch

## ISMP High-Alert Medication Definition

"Drugs that bear a heightened risk of causing significant patient harm when they are used in error"

Institute for Safe Medication Practices list of high-alert medications. Available at www.ismp.org/Tools/highalertmedications.pdf. Accessed July 2010.

## ISMP List of High-Alert Medication Classes

| | |
|---|---|
| Adrenergic agonists | Epidural or Intrathecal medications |
| Adrenergic antagonists | Hypoglycemics |
| Antiarrhythmics | Inotropic medications |
| Antithrombotic Agents | Sedative Agents |
| Cardioplegic solutions | Narcotics/Opiods |
| Chemotherapeutic Agents | Neuromuscular Blocking Agents |
| Hypertonic fluids | Radiocontrast Agents |
| Dialysis Solutions | Total Parenteral Nutrition Solutions |

Institute for Safe Medication Practices list of high-alert medications. Available at www.ismp.org/Tools/highalertmedications.pdf. Accessed July 2010.

## Insulin

- Examples: glargine, aspart, detemir, NPH
- Risks
  - Mix up between different insulin products
  - Using other patient's insulin
  - Abbreviating units with "U"
  - Incorrect rates programmed in pumps

## Insulin

- Adverse Events
  - Hypoglycemia
- Strategies for Prevention
  - Limit the number of products available
  - Separate stock
  - Avoid unapproved abbreviations
  - Auxiliary labels

## Sedatives & Analgesics

- Examples: morphine, hydromorphone, fentanyl, codeine, hydrocodone, midazolam, lorazepam
- Risks
  - Confusion between morphine & hydromorphone
  - Polypharmacy
  - Different patient populations
  - Incorrect rates programmed into pumps

## Sedatives & Analgesics

- Adverse Events
  - Lethargy
  - Respiratory depression
  - Constipation
- Strategies for Prevention
  - Limit availability
  - Avoid unapproved abbreviations
  - Auxiliary labels
  - Double checks
  - Standardize process

## Antithrombotic Agents

- Examples: warfarin, heparin, enoxaparin, fondaparinux, argatroban
- Risks
  - Incorrect rates
  - Dose difference for indication
  - Inappropriate monitoring
  - Dose adjustments in organ dysfunction
  - Narrow therapeutic range
  - Drug and food interactions
  - Complex dosing

## Antithrombotic Agents

- Adverse Events
  - Bleeding
- Strategies for Prevention
  - Dispense unit dose or pre-mixed when possible
  - Auxiliary labels
  - Limit availability
  - Separate stock
  - Double checks
  - Patient education

## Parenteral Electrolytes

- Examples: potassium chloride, calcium chloride, magnesium sulfate, 3% Sodium Chloride
- Risks
  - Floor stock may be mistaken for a low dose
  - Sound-Alike- Look-Alike drugs (SALAD)

## Parenteral Electrolytes

- Adverse Events
  - Cardiac arrest
  - Extravasation
- Strategies for Prevention
  - Standardize doses
  - Limit availability
  - Separate stock
  - Double checks

## Chemotherapeutic Agents

- Examples: cisplatin, carboplatin, cyclophosphamide, daunorubicin, etoposide
- Risks
  - SALAD
  - Complex dosing and regimens

## Chemotherapeutic Agents

- Adverse Events
  - Nausea, Vomiting
  - Myelosuppression
  - Organ dysfunction
  - Extravasation
- Strategies for Prevention
  - Standardize orders
  - Double checks
  - Separate storage
  - Auxiliary labels

## Neuromuscular Blocking Agents

- Examples: rocuronium, pancuronium, cisatracurium
- Risks
  - Vials may be mixed up
  - SALAD

## Neuromuscular Blocking Agents

- Adverse Events
  - Prolonged neuromuscular block
  - Apnea
  - Arrhythmia
- Strategies for Prevention
  - Double checks
  - Auxiliary labels
  - Separate stock
  - Limit availability
  - Standardize dosing and concentrations

## Summary of Strategies for Prevention of Errors

- Improve access to information
- Limit access to high-risk product
- Double checks
- Standardize processes
- Auxiliary Labels

## Summary of Strategies for Prevention of Errors

- Technology
- Secure medication in locked devices
- Avoid unapproved abbreviations
- Identify high-risk patients in advance
- Patient Education

## Review Questions

## What is the ISMP definition of a high-alert medication?

a) A drug on the hospital formulary

b) A SALAD

c) A drug that bears a heightened risk of causing significant patient harm when it is used in error

d) Any parenteral drug

## What is a common adverse event associated with insulin?

a) Constipation
b) Hypoglycemia
c) Paralysis
d) Cardiac arrest

## Which of the following is considered a parenteral electrolyte?

a) Enoxaparin
b) Insulin glargine
c) 3% NaCl
d) Rocuronium

## All of the following are strategies for prevention of errors in chemotherapeutic agents EXCEPT…

a) Separate Stock
b) Double check product
c) Store medications on the floor for nurses to prepare
d) Use auxiliary labels

## Limiting access to high-risk medications is considered a strategy for preventing errors?

a) True
b) False

## References


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