



Sentinel Event Alert

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High-Alert Medications and Patient Safety

Since the Joint Commission began tracking sentinel events in 1995, the Accreditation Committee of the Joint Commission's Board of Commissioners has reviewed 89 cases related to medication errors. Medication errors are one of the most common causes of avoidable harm to patients in health care organizations.

A study was conducted by the Institute for Safe Medication Practices (ISMP) during 1995 and 1996 to determine the drugs and situations most likely to cause harm to patients. Approximately 161 health care organizations submitted data on serious errors that had taken place during this period. The results of the study showed that a majority of medication errors resulting in death or serious injury were caused by a specific list of medications.

Medications that have the highest risk of causing injury when misused are known as high-alert medications. The top five high-alert medications identified by the ISMP study are insulin; opiates and narcotics; injectable potassium chloride (or phosphate) concentrate (See Sentinel Event Alert, Issue 1); intravenous anticoagulants (heparin); and sodium chloride solutions above 0.9 percent.

Here are a few common risk factors and suggested strategies for increasing patient safety with respect to these high-alert medications.

Reference:

Cohen, Michael R. and Kilo, Charles M. "High-Alert Medications: Safeguarding Against Errors." In Medication Errors, edited by Michael R. Cohen, 5.1-5.40. Washington, D.C.: American Pharmaceutical Association, 1999.

"Several measures may reduce the number of severe and fatal opioid adverse drug events at your organization.

...Of these measures, the most important is the use of a mechanical visual analog pain scale, particularly for post-operative patients whose pain severity is changing, for that is often the setting where opioid overdose occurs."

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"Medication errors have caused serious problems in health care organizations. It makes sense to be aware of risk reduction information and react to it before something serious takes place."

Michael Cohen, MS,
FASHP, President,
Institute for Safe
Medication Practices

Insulin

Common Risk Factors

- Lack of dose check systems
- Insulin and heparin vials kept in close proximity to each other on a nursing unit, leading to mix-ups
- Use of "U" as an abbreviation for "units" in orders (which can be confused with "O," resulting in a 10-fold overdose)
- Incorrect rates being programmed into an infusion pump

Suggested Strategies

- Establish a check system whereby one nurse prepares the dose and

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another nurse reviews it.

- Do not store insulin and heparin near each other.
- Spell out the word "units" instead of "U."
- Build in an independent check system for infusion pump rates and concentration settings.

Opiates and Narcotics

Common Risk Factors

- Parenteral narcotics stored in nursing areas as floor stock
- Confusion between hydromorphone and morphine
- Patient-controlled analgesia (PCA) errors regarding concentration and rate

Suggested Strategies

- Limit the opiates and narcotics available in floor stock.
- Educate staff about hydromorphone and morphine mix-ups.
- Implement PCA protocols that include double-checks of the drug, pump setting and dosage.

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Injectable Potassium Chloride or Phosphate Concentrate

Common Risk Factors

- Storing concentrated potassium chloride/phosphate outside of the pharmacy
- Mixing potassium chloride/phosphate extemporaneously
- Requests for unusual concentrations

Suggested Strategies

- Remove potassium chloride/phosphate from floor stock.
- Move drug preparation off units and use commercially available premixed IV solutions.
- Standardize and limit drug concentrations.
Intravenous Anticoagulants (Heparin)

Common Risk Factors

- Unclear labeling regarding concentration and total volume
- Multi-dose containers
- Confusion between heparin and insulin due to similar measurement units and proximity

Suggested Strategies

- Standardize concentrations and use premixed solutions.
- Use only single-dose containers.
- Separate heparin and insulin and remove heparin from the top of medication carts.
Sodium Chloride Solutions above 0.9 percent

Common Risk Factors

"The FDA is quite concerned about medication errors and their impact on patient safety and considers this a serious issue. From the FDA's perspective, this is a 'systems' problem and will require a joint effort from all health care participants to improve patient safety with respect to minimizing errors. The FDA's particular focus on this issue is with the labeling and/or packaging of drug products. This includes proprietary and generic names, misleading nomenclature and/or packaging that contributes to or has the potential to contribute to a medication error. All

- Storing sodium chloride solutions (above 0.9 percent) on nursing units
- Large number of concentrations/formulations available
- No double check system in place

Suggested Strategies

- Limit access of sodium chloride solutions (above 0.9 percent) and remove from nursing units.
- Standardize and limit drug concentrations.
- Double check pump rate, drug, concentration and line attachments.

The Joint Commission expects health care organizations to have systems in place to assure that the correct patient is getting the correct drug, in the correct dosage, at the correct times, by the correct route. To accomplish this on a consistent basis, organizations must have policies and procedures in place that address the ordering, preparing, dispensing, administering and monitoring of medication.

The Joint Commission makes this information available to assist health care organizations in reducing their risk of sentinel events. Health care organizations should consider the risk described in the Sentinel Event Alert, and determine their own most appropriate and effective responses to that risk.

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efforts, including a focus on high-alert drugs which cause sentinel events, are worthy goals."

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