



Drug Safety Review

Top 10 drug products involved in medication errors

Powerful pharmaceuticals cure diseases, ease pain, and improve the quality of life for millions of people. But these drugs can also be harmful when they are involved in errors. In addition to

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tracking medications associated with the errors, USP also tracks more than 50 causes and 13 types of medication errors through its MEDMARX and Medication Errors Reporting programs. Below are the drugs most frequently associated with actual and potential errors as reported to MEDMARX over a one-year period. Also included are the types and causes of the errors when they result in temporary or permanent harm or death. For medication errors classified as Category E-I (harmful or fatal outcomes) using the Error Category Index of the National Coordinating Council for Medication Error Reporting and Prevention, all types and causes are listed.

USP has found that as many as 1,400 different products have been involved in a single year's error reports, and many appearing in the top 10 are high-alert drugs. High-alert drugs consistently remain the most problematic products involved in medication errors, and the most serious outcomes of errors have been associated with these drugs, particularly for elderly patients. The high-alert drugs appearing below include insulin, morphine, potassium chloride, heparin, warfarin, and others. Despite the classification of these drugs as high-alert, facilities find it difficult to devise safe methods for using these products. Although the reasons for this

difficulty are unclear and require further research, they could be due in part to the following: the sheer volume of use of high-alert drugs, inadequate procedures and protocols to ensure their

safe use, noncompliance with established policies and procedures, or inadequate staff training in the established procedures and protocols.

Performance improvement activities for the top 10 products listed below can center on the drug class (based on the VA medication classification system) as a whole to ensure that they are used safely. For reports submitted to MEDMARX in calendar year 2002, USP found the following classes to represent the most harmful outcomes:

- Central nervous system medications
 - Opioid analgesics
 - Sedatives/hypnotics/anxiolytics
 - Anticonvulsants
- Cardiovascular medications
 - Beta-blockers
 - Diuretics
 - Calcium-channel blockers
- Hormones/synthetics/modifiers
 - Insulins
 - Oral antidiabetic agents
 - Adrenal corticosteroids

The Medication Errors Reporting Program is presented in cooperation with the Institute for Safe Medication Practices.

TOP 10 PRODUCTS CITED IN USP MEDMARX ERROR REPORTING

JULY 2002 THROUGH JUNE 2003

| Product name* | Type of error (Report category E-I) | Cause of error (Report category E-I) |
|---------------|---|--|
| 1. Insulin | Omission error Improper dose/quantity Unauthorized drug Prescribing error Wrong patient | Performance deficit Procedure/protocol not followed Knowledge deficit Communication Transcription inaccurate/omitted |
| 2. Albuterol | Omission error Unauthorized drug Wrong time Improper dose/quantity Wrong drug preparation | Performance deficit Procedure/protocol not followed Communication Computer entry Information management system |



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| Product name* | Type of error (Report category E-I) | Cause of error (Report category E-I) |
|--------------------------------|---|--|
| 3. Morphine | Improper dose/quantity Omission error Prescribing error Unauthorized drug Extra dose | Performance deficit Procedure/protocol not followed Knowledge deficit Dispensing device involved Communication |
| 4. KCl (potassium chloride) | Improper dose/quantity Prescribing error Omission error Unauthorized drug Wrong patient | Performance deficit Monitoring inadequate/lacking Procedure/protocol not followed Communication Knowledge deficit |
| 5. Heparin | Improper dose/quantity Omission error Unauthorized drug Prescribing error Extra dose | Performance deficit Procedure/protocol not followed Communication Knowledge deficit Monitoring inadequate/lacking |
| 6. Cefazolin | Omission error Prescribing error Unauthorized drug | Performance deficit Procedure/protocol not followed Communication Contraindicated, drug allergy Documentation |
| 7. Warfarin | Omission error Improper dose/quantity Extra dose Unauthorized drug Prescribing error | Performance deficit Procedure/protocol not followed Communication Transcription inaccurate/omitted Computer entry |
| 8. Furosemide | Omission error Improper dose/quantity Extra dose Prescribing error Wrong time | Performance deficit Procedure/protocol not followed Transcription inaccurate/omitted Communication Documentation |
| 9. Levofloxacin | Omission error Prescribing error Improper dose/quantity Wrong patient | Performance deficit Procedure/protocol not followed Communication Contraindicated, drug allergy System safeguard(s) |
| 10. Vancomycin | Omission error Improper dose/quantity Prescribing error Wrong time Wrong patient | Performance deficit Procedure/protocol not followed Communication Transcription inaccurate/omitted Knowledge deficit |

*Includes all dosage forms and formulations

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