Drug Safety Review

Medication error trends for 1999-2003

Each year, beginning with 1999, United States Pharmacopeia (USP) has conducted an analysis of aggregate data submitted to the MEDMARX error reporting system database. The most recent report examines error trends over the five-year period 1999-2003. It also includes a special focus on technology-related errors, specifically computer entry, computerized prescriber order entry, and automated dispensing devices.

The number of records submitted to the MEDMARX database in 2003 totaled 235,159, far exceeding the number submitted in any prior year. The increase was due, in part, to an 18% increase in participating MEDMARX facilities that rose from 482 in 2002 to 570 in 2003. The majority of subscribing facilities were nonprofit hospitals and related health systems.

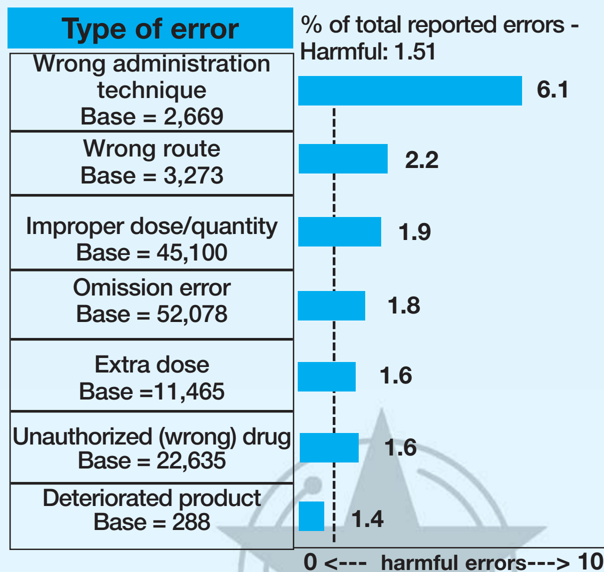
Leve of harm

In 2003, the majority of reported medication errors did not result in patient harm; only 1.51% resulted in some level of harm. Favorable trends were seen when data over the five-year period 1999-2003 were examined. The percentage of reported medication errors intercepted before reaching the patient steadily increased from 23% (1999) to 38% (2003). A decrease occurred in the percentage of reported medication errors reaching the patient, from 55% in 1999 to 45% in 2003. The 2003 harm threshold of 1.51% is nearly half the five-year peak of 3% that occurred in 2000.

Where errors originate

The percentage of reported errors originating in the prescribing node has steadily increased from 11% (1999) to 23% (2003). This increase may reflect an increased emphasis on the detection and reporting of errors in the early stages of the medication use process. It may also indicate that pharmacists are beginning to document their interventions (i.e., changes made to an order that was deemed inappropriate or incorrect) as a prescribing error. A slight upward trend was seen in errors reported to have originated in the dispensing node which showed an increase from 17% (1999) to 22% (2003). The increases in prescribing and dispensing node errors were offset by a decline in the percentage of errors in the administering node.

Cross-tabulation analysis of types of errors by harm, CY 2003*



*There are 13 different types of errors, with only the top seven most harmful displayed.

Types of errors

Patterns in frequency and harmful outcomes seen in previous data reports were similar to those in CY 2003. Nearly 80% of the records were associated with the four leading types of errors (omission error, improper dose/quantity, prescribing error, and unauthorized drug), representing a slight increase from the 75% reported in 2002. A two-way cross-tabulation analysis of the Types of Error by Error Category Index revealed that six types of errors exceeded the overall harm threshold of 1.51%. This is the fourth report to indicate that harmful errors disproportionately arise from either wrong administration technique or wrong route (see figure).

Products

The number of unique product groups identified in 2003 was 1,559—an increase over the 1,400 reported in the previous year. Insulin products were most often cited in errors overall and errors that resulted in harm. An examination of the products involved in fatal errors (n=24) revealed that five drugs (enoxaparin, heparin, morphine, nitroglycerin, and warfarin) were on this same list one year ago.

The information in the *MEDMARX 5th Anniversary Data Report* contains many more findings and is aimed at researchers, clinicians, policy makers, and other patient safety stakeholders with the goal of providing tangible evidence that will drive change. USP is committed to providing meaningful information that contributes further to the growing knowledge base surrounding medication error reporting and prevention and to the safe use of medicines. The complete report can be obtained at **www.usp.org**. Click on the "USP Store" tab.

by
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USP operates two complementary reporting programs: the Medication Error Reporting Program, presented in cooperation with the Institute for Safe Medication Practices, and MEDMARX. For more information on how to report errors, visit: **www.usp.org/patientsafety**.

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