Institute for Safe Medication Practices
1800 Byberry Road, Suite 810, Huntingdon Valley, PA 19006
www.ismp.org

Computer Weaknesses Compromise Medication Safety

HUNTINGDON VALLEY, Pa.—Many hospital pharmacy computer systems may not be doing an adequate job of detecting potentially unsafe medication orders. According to surveys conducted by the Institute for Safe Medication Practices (ISMP), these systems are not reliably detecting and correcting prescription errors or pharmacy order entry errors, and little improvement has occurred over the last six years.

One hundred and eighty-two readers of ISMP's *Medication Safety Alert!* newsletter responded to this year's survey, which the Institute also conducted in 1999. Respondents were asked to create a test patient in their medication order entry system used by pharmacists and place a series of orders provided by ISMP to field test when safety warnings appeared. All of the test elements were associated with actual errors or hazards reported to ISMP and published in the *Medication Safety Alert!*

2005 Survey Results
In 2005, only 4 of the 182 computer systems tested were able to detect all the unsafe orders. Disturbingly, less than half were able to detect orders for medications that exceeded a safe maximum dose. Another flaw was that when unsafe orders were detected, an average of 9 in 10 systems allowed the user to override the serious warnings, in most cases by simply pressing a function key.

Most systems were able to provide reports of drug warning overrides and permitted staff to build alerts for serious error-prone situations. However, only half of the computer systems tested allowed the use of tall man letters to differentiate look-alike drug names, and just 9% allowed users to change the font and color to highlight look-alike drug name pairs.

Two new areas tested in 2005 also fared poorly. Just 1 in 5 computer systems were able to intercept the entry of a contraindicated drug based on the patient's diagnosis or condition (pregnancy). And only 1 in 4 was able to detect a clinically significant drug/herbal interaction.

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Comparison with 1999 Survey

Compared to the survey results from 1999, pharmacy computer systems in 2005 performed even less reliably in many areas. For example, fewer systems tested in 2005 offered dose alerts based on the patient's age or weight/BSA. And while most systems tested in 1999 were able to intercept orders for drugs to which patients were allergic, less than half tested in 2005 alerted staff when an order for FLUZONE (influenza virus vaccine) was ordered for a patient allergic to eggs.

On the plus side, some improvement was observed with detecting contraindicated drugs or doses based on lab results. Compared to 1999, more pharmacy computer systems today are directly interfaced with the laboratory system and more systems can automatically alert staff according to current lab values. Also, respondents' current pharmacy systems performed better than in 1999 with detecting duplicate therapy, with three quarters of the systems tested this year able to detect a significant drug/drug interaction.

Possible Reasons for Lack of Improvement

Failure to update technology may be one explanation for the general lack of improvement in pharmacy computer systems over the last six years. More than half (56%) of the 2005 survey participants were using a pharmacy system that was at least 5 years old, with no recent upgrades. In fact, 38% had been using the same system for 8 years or more without upgrades.

Drug information providers' software and lack of timely installation of updates may provide another explanation for poor field test results. If a software vendor deems certain types of warnings unimportant, they may be omitted. Or if the content is not current or adequate, important alerts may not appear.

ISMP's surveys were not intended to test computerized *physician* order entry systems, but if pharmacy systems are not adequate, the lack of crucial independent screening provided by pharmacists may allow unsafe orders to proceed. Improved pharmacy technology should be a national priority to reduce the risk of serious patient harm from medication errors. Pharmacists should take the field test and contact their vendors (both pharmacy software and drug information providers) to request any necessary changes. The field test and full survey results can be found at www.ismp.org/s/survey200505R.asp

About ISMP: The Institute for Safe Medication Practices (ISMP) is a 501c(3) nonprofit organization that works closely with healthcare practitioners and institutions, regulatory agencies, consumers, and professional organizations to provide education about medication errors and their prevention. ISMP represents nearly 30 years of experience in helping healthcare practitioners keep patients safe, and continues to lead efforts to improve the medication use process. For more information on ISMP, or its medication safety alert newsletters for healthcare professionals and consumers, visit www.ismp.org

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