Computerized warning system alerts doctors to medications that could harm elderly patients

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Adverse drug events, such as dizziness or confusion occur in an estimated 40 percent of all hospital patients and can be the result of inappropriate medications being ordered. Not surprisingly, elderly individuals are particularly vulnerable to these adverse events, which not only result in longer hospitalizations, but can also pose a threat of serious complications and even death.

Now a study by researchers at Beth Israel Deaconess Medical Center (BIDMC) finds that a specially programmed computer warning system can significantly reduce doctors' orders for drugs that pose a danger to older patients. The findings are reported in the August 9-23 issue of the *Archives of Internal Medicine*, which appears on-line today.

"We have long known that certain commonly prescribed drugs can be harmful to older patients," says geriatrician and lead author Melissa Mattison, MD, Associate Director of Hospital Medicine at BIDMC and Instructor of Medicine at Harvard Medical School. "But because the majority of doctors have not been trained in geriatric medicine, they may not be aware of these risks. Our study found that when doctors were alerted that the drugs they were ordering could pose a danger to older hospital patients, the orders dropped almost immediately."

Computerized provider order entry (CPOE) enables physicians to electronically order medications and treatments for hospital inpatients

and was developed, in part, to help prevent errors in prescribing medications (such as drug allergies or drug-drug interactions). CPOE systems can be programmed to issue a computerized "warning message" that alerts physicians to possible problems and conflicts. BIDMC first started using a CPOE system approximately 10 years ago.

In 2004, Mattison, together with a pharmacist and computer information specialist, began work to develop a specialized version of the CPOE system that could be used to help doctors in prescribing medications for elderly patients. The new system uses components of the Beers List, which was developed by physician Mark Beers in 1993 to draw attention to dozens of common drugs that should be prescribed "with caution" to elderly patients.

"Many drugs commonly used today have not been tested in seniors or elderly patients," explains Mattison. "As a result, a dose that is appropriate for a younger adult may lead to potentially harmful side effects in older individuals, who tend to metabolize medications more slowly." In addition, she adds, seniors and elders are often already taking multiple medications, resulting in a situation that can predispose seniors to potentially dangerous side effects.

In designing the new CPOE system, the authors were mindful of the risks posed by information overload. "We did not want to overdo the warnings," explains Mattison. "Too many 'alerts' just lead to user fatigue and people stop paying attention, which makes a warning system useless." The authors, therefore, carefully selected a small group of 18 medications from the Beers list that are commonly prescribed in the inpatient hospital setting and for which alternative medications were available. Since 2005, doctors at BIDMC who attempt to order one of these 18 Beers drugs for a patient 65 years of age or older, receive a "warning" on their computer screen, informing them of potential risks. Although the doctor can override the warning and continue to prescribe

the medication, he or she must provide an explanation for the decision, which is selected from a list that is provided by the system.

Mattison and her colleagues then formally tested this system. "For three and a half years, we measured the number of orders of the 18 selected Beers medications that were made each day," she explains. "We also monitored the use of several medications that were part of the original Beers list, but were not flagged in our warning system." Their results showed that orders for flagged medications dropped from 11.56 to 9.94 total orders per day, and dropped from 0.070 to 0.045 orders per total number of patients per day, amounting to a decrease of approximately 20 percent in the use of flagged medications. They found that the number of orders for unflagged medications did not change.

"To our knowledge, no CPOE system has previously been described that utilizes a warning system built around PIMs [potentially inappropriate medications] in older, hospitalized adults," the authors write. "Up to 60 percent of adverse drug events occur at the time that medications are ordered. CPOE provides an opportunity for intervention to change prescribing practices."

Adds Mattison, "Historically speaking, medical schools do not provide students with much training in the unique needs of geriatric patients. Yet, with the exception of pediatrics or obstetrics, you can't name a field in medicine where doctors are not routinely caring for older individuals, and as the population ages, this will only increase. Using CPOE to guide care at the point of ordering - to steer clinicians to choose potentially better alternative medications and treatments - is an exciting opportunity to improve care for this vulnerable population."

Provided by Beth Israel Deaconess Medical Center

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