Chemotherapy Errors Rare, But Have Potential For Serious Consequences

Oct. 24, 2005 — About one out of 30 chemotherapy orders at three ambulatory infusion clinics had errors, and one in 50 orders had a serious error, according to a study appearing in the December 1, 2005 issue of CANCER (http://www.interscience.wiley.com/cancer-newsroom), a peer-reviewed journal of the American Cancer Society. The study, performed at the Dana-Farber Cancer Institute, found most but not all errors were detected before they reached the patient. None was life-threatening or caused patient harm. Still, an accompanying editorial says the study underscores the need to implement safer controls of drug ordering and dispensing at chemotherapy infusion clinics.

Medication errors in hospitals are a stark reminder of the potential harm that can occur when patients are admitted to the hospital. While most medications are well tolerated, a few classes are toxic and require complex dosing regimens, such as those used in chemotherapy. Even a low error rate from these medications could potentially lead to significant harm, including death.

Aside from a few case reports in journals and popular media, little research has investigated the error rate of chemotherapy orders at outpatient clinics or hospitals. Some individual institutions that have been affected by these reported errors, such as the Dana-Farber Cancer Institute (a member of the Dana-Farber/Harvard Cancer Center, a National Cancer Institute-designated comprehensive cancer center), have made extensive changes to prevent such errors, such as computerization of the medication ordering system.

Led by Tejal K. Gandhi, M.D., M.P.H. and Sylvia B. Bartel, R.Ph., M.H.P., researchers from the Brigham and Women's Hospital, the Dana-Farber Cancer Institute, and the Harvard School of Public Health reviewed over 10,100 medication orders from one pediatric and two adult ambulatory clinics, which used either a paper or computerized medication ordering system.
The researchers used a strict definition of error and counted any mistake in the medication process, including ordering, dispensing, transcribing, administering, and monitoring.

The review of orders demonstrated an overall medication error rate of three percent and a serious error rate of two percent, less than the five percent rate on all orders identified in previous studies. Categorized according to the severity of the error, 82 percent of the errors in adults and 60 percent in children had the potential to cause an adverse drug event (ADE) had they reached a patient. Of these, approximately 33 percent could have caused serious harm. Nearly half were intercepted by existing systemic checks before they reached the patient and none actually caused an ADE.

In the adult clinics, which used a computerized ordering system, the most frequent errors were due to omission of dosages and orders not being discontinued. In the pediatric clinic, which used a paper-based ordering system, the most frequent errors were due to orders not being discontinued and incorrect dosages.

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In an accompanying editorial, Jonathan R. Nebeker, M.S., M.D. and Charles L. Bennett, M.D., Ph.D., M.P.P. write that the study "represents an important step in implementing computerized solutions and other system changes that are designed to improve pharmaceutical safety in the ambulatory oncology setting."

Article: "Medication Safety in the Ambulatory Chemotherapy Setting," Tejal K. Gandhi, Sylvia B. Bartel, Lawrence N. Shulman, Deborah Verrier, Elisabeth Burdick, Angela Cleary, Jeffrey M. Rothschild, Lucian L. Leape, David W. Bates, CANCER; Published Online: October 24, 2005 (DOI: 10.1002/cncr.21442); Print Issue Date: December 1, 2005.

Editorial: "Reducing Adverse Drug Events in the Outpatient Chemotherapy Setting: Attention Must be Paid," Jonathan R. Nebeker, Charles L. Bennett, CANCER; Published Online: October 24, 2005 (DOI: 10.1002/cncr.21445); Print Issue Date: December 1, 2005.

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