

# Most pediatric chemotherapy mistakes reach patients

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The vast majority of chemotherapy errors identified in children reach patients, according to one of the first epidemiological studies of cancer drug errors in children. Published in the July 1, 2007 issue of *CANCER*, a peer-reviewed journal of the *American Cancer Society*, the study concluded that the antimetabolite class of chemotherapeutic agents are most likely associated with errors, and that errors in drug administration and errors in drug dosing and frequency were the most common mistakes made and consequently, the most potentially harmful.

Chemotherapeutic drugs have been credited with significant gains in survival from pediatric cancers. However, they are among the most toxic medications used today. Calculating dose, route, and frequency, which are often based on a child's weight, are critical to ensure that the drug concentration in the blood is within its narrow safety margins.

Medication errors are common during pediatric hospitalizations, occurring in almost 6 percent of all medication orders for pediatric inpatients. One of the only comprehensive studies of pediatric chemotherapy errors found that 13 percent of such errors reached children and 2 percent were serious and required intervention.

Dr. Marlene Miller of Johns Hopkins University and colleagues conducted a comprehensive review of a nationwide medication error database of inpatient facilities and outpatient clinics to characterize the patterns of errors and their causes for children receiving chemotherapy. Between 1999 and 2004, 829,492 errors were reported, of which 29,802

involved patients under 18 years old and 310 of these involved a chemotherapeutic drug.

The authors of the study found that 85 percent of these errors reached the patients. Sixteen percent were serious enough to require escalation of care, of which five patients required treatment or longer hospitalization. Of the 387 chemotherapeutic agents reported, the ones most commonly associated with errors were part of the antimetabolite class (40 percent), which includes Methotrexate (15 percent) and Cytarabine (12 percent).

Almost half of all errors occurred in administration of the drug and errors were commonly related to improper dosing (23 percent), timing or frequency (23 percent). Interestingly, compared to inpatient facilities, outpatient clinics were more likely to involve prescribing and dose calculation errors. Over 40 percent of errors were attributed to a "performance deficit" while communication and knowledge deficits accounted for only 9 percent and 7 percent, respectively. Outpatient errors were more likely to be attributed to the delivery device, brand name similarities and stress.

Dr. Miller and her coauthors concluded that pediatric chemotherapy errors often reach the patient. These errors, they explained, "were potentially harmful to the pediatric patient population and differed in quality between outpatient and inpatient oncology areas." Since most of the errors occurred during administration of the drug, not prescribing, "pediatric hospitals and future quality improvement research should target medication administration safeguards for these high risk medications and consider different and specific solutions for inpatient and outpatient pediatric oncology units respectively."

Source: John Wiley & Sons, Inc.

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