

# Before You Press That Button: A Look at Chemotherapy Errors

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Medication errors in chemotherapy occur frequently and have a high potential to cause considerable harm. IV infusion errors, which usually involve high-risk medications delivered directly into the patient's bloodstream, have been identified as having the greatest potential for harm. IV infusion programming errors have a greater likelihood of causing injury or death. Nurses must strive to keep patient safety at the forefront of their nursing practice. Understanding the issues associated with chemotherapy infusion errors and preventive strategies will provide oncology nurses with a foundation for eliminating such errors.

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About 23 million adult outpatient visits for chemotherapy occur annually in the United States (Friese et al., 2011). Of those visits, about 19 million (84%) are delivered in ambulatory settings, the majority of which are delivered by nurses (Centers for Disease Control and Prevention, 2007). Errors in chemotherapy orders have been reported to occur with a frequency of at least 40% (Markert, Thierry, Kleber, Behrens, & Engelhardt, 2009). Chemotherapy has a high potential to cause considerable harm. Although any class of drugs is susceptible to errors, chemotherapy presents special dangers because (a) many drugs have a narrow therapeutic index, (b) chemotherapy drugs are toxic even at therapeutic doses, (c) chemotherapy regimens are highly complex, and (d) patients with cancer are a vulnerable population as they often cannot tolerate mistakes (Schulmeister, 2006). Chemotherapy errors can include under and overdosing, schedule and timing errors, administration of the wrong drug, and

other incidents, such as infusion rate errors, omission of drugs or hydration, and improper preparation of drugs that require medical intervention and prolonged hospital stays (Schwappach & Wernili, 2010).

Administration is the stage of the medication process most vulnerable to error. The IV route of drug administration often results in the most serious outcomes of medication errors. IV infusion errors, which usually involve high-risk medications delivered directly into the patient's bloodstream, have been identified as having the greatest potential for patient harm (Maddox, Danello, Williams, & Fields, n.d.). Although not every potential adverse drug event results in patient injury, IV infusion programming errors, in comparison to other medication errors, have a greater likelihood of causing injury or death (Maddox et al., n.d.). Once the nurse presses the "start" button on an infusion device (unless a programming error can be intercepted automatically by the infusion device), the

IV infusion at the incorrect rate will be delivered to the patient.

What are some strategies that can be used to avoid these types of chemotherapy errors? Computerized IV infusion safety systems—smart pumps—have been on the market since 2002. Smart pumps are specifically designed to avert IV infusion programming errors and provide actionable data on various aspects of the errors. Implementation of an IV infusion safety system might be the best initial approach to safeguard patients against high-risk medication errors. Smart pump technology should be encouraged to augment current medication safety practices. The addition of safety features such as dose alerts, dosing and flow rate limits, and other programming safeguards will allow for detection of pump programming errors.

High-alert medication policies require a defined independent check system that must be performed when dealing with high-alert medications. Most facilities that administer chemotherapeutic agents require the nurses to do an independent check or a "time-out" for the verification process. Independent checks or verification usually are performed by two chemotherapy competent nurses and include the following steps.

- Laboratory values are checked independently by each nurse.
- A nurse checks the order independently followed by the independent review by a second nurse.
- A nurse checks the product label against the original order using two patient identifiers; the second nurse verifies.
- Both nurses proceed to the patient and verify that he or she is the correct patient using two patient identifiers.