

## FEATURE ARTICLE

# A Model of Chemotherapy Education for Novice Oncology Nurses That Supports a Culture of Safety

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Chemotherapy education at a mid-sized community hospital was redesigned to help novice oncology nurses improve patient safety and their own practice by implementing error prevention techniques during chemotherapy administration. Using a proactive approach with multidisciplinary participation and open communication, a systems analysis was conducted to identify potential chemotherapy errors. Then, chemotherapy processes were devised or strengthened to avoid errors. The project required a philosophical shift from error measurement to safety promotion.

**M**edication errors that occur in or out of U.S. hospitals account for more than 7,000 deaths annually (Institute of Medicine, 2000). Each year, more than 48,000 newly diagnosed patients with cancer experience adverse events related to their medical care. Historically, a fifth of those adverse events are medication related, and two-thirds are preventable (Dinning, Branowicki, O'Neill, Marino, & Billet, 2005). Chemotherapy tops the list of high-alert medications in a survey of nurses and pharmacists, outranking IV potassium chloride and insulin as a potential threat to patient safety (Institute for Safe Medication Practices, 2003). High-alert medications have a high risk of substantially harming patients if a medication error or adverse event occurs. Chemotherapeutic agents are in that category; errors related to their use can be lethal because their therapeutic index is lower and safety margin narrower than those of other drug classes (Muller & Kloth, 2005). The advent of supportive agents has lessened potentially life-threatening occurrences such as neutropenia, but no agents can repair fatal cardiac, renal, or pulmonary toxicities that can arise from a chemotherapy error (Muller & Kloth).

Chemotherapy is prone to errors for many reasons; even small errors can cause major harm. As a classification of medications, chemotherapy is unique in that dosing is individualized, not standardized. Doses are computed based on factors such as body size or renal function and require patient-specific calculation. Sometimes dose adjustments are required, which adds a second calculation (Sheridan-Leos, Schulmeister, & Hartranft, 2006). Also, complex multidrug chemotherapy protocols often are used to treat cancer, and the more medications administered, the greater the potential for error. Furthermore, chemotherapeutic agents are given in several ways (subcutaneously or via IV) and in different doses (standard or high doses) over various periods of time (bolus or continuous infusions). Some

### At a Glance

- ◆ Many variations in chemotherapy prescriptions and administration can result in life-threatening errors.
- ◆ Chemotherapy errors usually are attributed to a number of events involving staff members from various disciplines; therefore, participation in chemotherapy error prevention is essential for all staff who order, prepare, and administer chemotherapeutic drugs.
- ◆ Devising an educational model for novice oncology nurses can support a culture of safety by preventing chemotherapy-related errors.

agents can be given safely by one route but not by another. For example, some agents can be given intrathecally, whereas other agents administered that way are potentially life threatening. The many variations in chemotherapy prescriptions and administration can lead to errors. In addition, the proliferation of new chemotherapeutic agents requires nurses to continuously update their knowledge. Apart from oncology-specific risk factors for error, chemotherapy errors can occur because of understaffing, poor communication, human error, fatigue, and environmental factors (Cohen, 2000). Finally, patients with cancer can be compromised physically for various reasons: past

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