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# Improving the Safety of Chemotherapy Administration: An Oncology Nurse-Led Failure Mode and Effects Analysis

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Administration of chemotherapy is an important aspect of cancer nursing, and one for which demand has risen sharply since the early 2000s (National Chemotherapy Advisory Group, 2009; Summerhayes, 2003). Treatment regimens typically involve several chemotherapeutic and supportive agents, many of which require individualized dosing (e.g., body surface area, renal function) and are administered by a variety of routes (e.g., orally, IV) and at different rates (e.g., bolus, continuous infusion). Delivery of a regimen at any one administration session can, therefore, take several hours and involve multiple nurses. And, as patients progress through treatment, side effects and toxicity must be monitored and controlled and regimens may change. This complex and dynamic nature of chemotherapy administration makes the process highly vulnerable to errors (Gandhi et al., 2005; Walsh et al., 2009; Weingart et al., 2010). In addition, as patients with cancer often are frail and immunocompromised, and chemotherapeutic agents are high-alert medications, errors in this process can result in serious patient harm and even death (Cousins & Upton, 1994; Institute for Safe Medication Practices [ISMP], 2008; Trinkle & Wu, 1996). Perhaps unsurprising, therefore, is that in a survey of more than 200 oncology nurses, 95% reported “being frightened, scared and anxious” when first working with chemotherapy (Verity, Wiseman, Ream, Teasdale, & Richardson, 2008, p. 244). Although it is impossible to eliminate the risks inherent in health care, taking steps to minimize errors and their consequences is advisable.

Traditionally, efforts to improve the safety of health-care processes have been reactive and generally have entailed focused investigations following particular adverse incidents. However, in addition to intermittent retrospective actions following specific incidents, a need exists for broad, ongoing, proactive efforts to manage risk and improve safety *before* errors occur (Christian

**Purpose/Objectives:** To assess and improve the safety of hospital-based adult chemotherapy administration.

**Design:** Prospective, systems-focused clinical risk assessment.

**Setting:** An adult inpatient and outpatient oncology unit in a large urban hospital in the United Kingdom.

**Sample:** 8-person nurse-led multidisciplinary team, which included managerial staff and patient safety researchers.

**Methods:** Failure mode and effects analysis (FMEA), a prospective, systems-focused risk assessment methodology, was undertaken in biweekly team meetings and included mapping the chemotherapy administration process, identifying and numerically prioritizing potential errors (failure modes) for each process step, and generating remedial strategies to counteract them.

**Main Research Variables:** The analysis aimed to identify chemotherapy administration failure modes and to generate remedial strategies to address them. User feedback on the FMEA process also was collected.

**Findings:** Several specific chemotherapy failure modes were identified, the majority of which had not previously been recognized, and several novel strategies to counteract them were generated. Many of the strategies were specific, environment-focused actions, which are simple, quick, and inexpensive to implement; however, more substantive, longer-term initiatives also were generated. User feedback generally was very positive, and the process of undertaking the analysis improved multidisciplinary teamwork and communication.

**Conclusions:** Although time and resource intensive, FMEA is a useful safety improvement tool.

**Implications for Nursing:** Nurses should be aware of and informed about FMEA as a tool they can use in partnership with management and other disciplines to proactively and collectively improve the safety of high-risk oncology procedures such as chemotherapy administration.

et al., 2006; Senders, 2004; Smith, Boulton, Woods, & Johnson, 2010). In addition to a move toward proactive safety management in health care, a shift away from person-centered views of safety and toward a more