Hazardous Drug Exposure

Case report analysis from a prospective, multisite study of oncology nurses' exposure in ambulatory settings

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BACKGROUND: Hazardous drug exposure is an occupational health hazard to oncology nurses. Sparse data are available regarding the frequency and characteristics of hazardous drug spills.

OBJECTIVES: This article aims to describe nurses' hazardous drug exposures and use of personal protective equipment during drug spills.

METHODS: The Drug Exposure Feedback and Education for Nurses' Safety study launched in March 2015. When drug spills occurred, consented RNs administering chemotherapy in ambulatory infusion settings completed brief questionnaires. Descriptive statistics were used to summarize equipment use and spill events.

FINDINGS: Spills were common, despite the use of closed-system transfer devices. Over two years, 51 nurses from 12 participating academic infusion centers reported 61 unique spills. Spills commonly involved highly toxic drugs. Personal protective equipment use during drug spills was suboptimal. These foundational data reveal gaps in clinical practice.

KEYWORDS
oncology; hazardous drugs; occupational health; ambulatory; administration

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ONCOLOGY NURSES ADMINISTER TREATMENTS TO PATIENTS that authorities recognize as hazardous to human health (Connor & McDiarmid, 2006). Since 1942, nurses have prepared and/or administered hazardous drugs to patients with cancer (Yarbro, 1996). Real and potential adverse health events have been correlated with hazardous drug exposure (National Institute for Occupational Safety and Health [NIOSH], 2018). In response, NIOSH, the Oncology Nursing Society, the American Society of Health System Pharmacists, and the U.S. Pharmacopeial Convention have issued guidance on how clinicians can minimize hazardous drug exposures (Connor et al., 2017). An array of control measures—use of closed-system transfer devices, externally ventilated biologic safety cabinets for compounding activities, training/education, and consistent use of personal protective equipment (PPE)—reduces the potential for indirect and direct exposures. However, nurses and clinical settings do not adopt these evidence-based control measures consistently. According to the Nurses' Health Study 3, 25% of nurses reported that they never wore gowns during hazardous drug administration, confirming similar findings from a 2006 study (Lawson et al., 2019; Polovich & Martin, 2011).

Oncology nurses face exposure potential from indirect (e.g., surface contamination) and direct (e.g., drug spill) sources. To date, no prospective studies have examined direct exposures in detail. A deeper understanding of the patterns and correlates of drug spills may identify opportunities for risk reduction and clinical practice change. Data collection from multiple clinical sites improves the generalizability of these findings across the diverse landscape of clinical oncology nursing practice.

As part of a larger randomized controlled trial of an educational intervention, the current study team collected detailed data on hazardous drug spills that occurred during the project, including PPE worn when a hazardous drug spill occurred. The analyses reported in the current article document the frequency of hazardous drug spills in participating sites and the context in which these exposures occurred. The findings have implications for strengthening the safety net for oncology nurses who handle hazardous drugs in clinical practice.

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