



Safe Handling: Implementing Hazardous Drug Precautions

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Occupational exposure to chemotherapy is a significant and ubiquitous danger to oncology nurses. The Oncology Clinical Nurse III/IV leadership group at the University of North Carolina Hospitals embarked on the challenge of a comprehensive standards review regarding personal protective equipment necessary when handling waste after hazardous drug administration. This review led to practice improvements in education, the use of chemotherapy-rated gloves when handling hazardous waste, and changes in the disposal options available to staff. A discharge teaching pamphlet on safe handling for the caregivers of patients receiving hazardous drugs was created and piloted.

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According to Nelson (2010), occupational exposure to chemotherapy is highest among pharmacists that mix chemotherapy and nurses that administer these agents. Research has shown that chronic exposure to low doses of chemotherapy in the workplace may lead to adverse health outcomes (National Institute for Occupational Safety and Health [NIOSH], 2004). According to NIOSH (2004), “working with or near hazardous drugs in healthcare settings may cause skin rashes, infertility, miscarriage, birth defects, and possibly leukemia or other cancers” (p. iii). Exposure to hazardous drugs also may occur with aerosolization and during contact with contaminated clothing, work surfaces, medical equipment, and patient excreta (NIOSH, 2004).

Nursing and pharmacy personnel at the University of North Carolina Hospitals (UNCH) participated in a study

by Connor et al. (2010) to evaluate occupational exposure to chemotherapy agents. Connor et al. (2010) evaluated nursing and pharmacy employees who handle chemotherapy and chemotherapy waste ($n = 68$) and nonexposed participants ($n = 53$) at three university-based cancer center in the United States. Results demonstrated that, despite compliance to recommended safe-handling procedures, 86 of the 143 surface-wipe samples (60%) collected at the three institutions were positive for at least one of the five chemotherapy agents tested: cyclophosphamide, cytarabine, ifosfamide, 5-fluorouracil, and paclitaxel. Of the 60 personal air samples obtained, 48 were from exposed personnel and 12 from nonexposed participants. Only one exposed nursing participant's personal air sample had detectable levels of cyclophosphamide. Of 67 urine samples

collected from exposed participants, three pharmacy employees had detectable levels of either cyclophosphamide or paclitaxel. Blood sample analysis used the comet assay, which detects DNA damage in single cells. No genetic damage was noted among the 66 exposed personnel tested or the 50 nonexposed personnel (Connor et al., 2010).

After reviewing NIOSH (2004) and Connor et al. (2010), the UNCH Oncology Clinical Nurse III/IV (CN III/IV) leadership group amended the safe-handling practices at UNCH by updating the handling and disposal of hazardous drugs policy that addresses the safe handling of hazardous drugs during administration and waste disposal.

Policy Review

After reviewing the policy on the handling of bodily fluids after hazardous drug administration with NIOSH (2004), as well as recommendations from the Oncology Nursing Society (ONS) (Polovich, 2003) and Association of Pediatric Hematology/Oncology Nurses (APHON) (Kline, Echtenkamp, Rae-Zahradnki, & Wills, 2007), UNCH policy was found to be in compliance except for two nurse practice areas: (a) use of double chemotherapy gloves for bodily fluids for the administration of chemotherapy or hazardous drugs, and (b) disposal of trace waste, tubing, plastic-backed absorbent pads, and materials used during chemotherapy administration. Trace waste should be disposed of in biohazard trash for incineration, as well as sharps containers for syringes with traces of chemotherapy. The Oncology CN III/IV leadership group reinforced this part of the policy with reeducation.