

# Factors Influencing Oncology Nurses' Use of Hazardous Drug Safe-Handling Precautions

Martha Polovich, PhD, RN, AOCN<sup>®</sup>, and Patricia C. Clark, PhD, RN, FAHA, FAAN

**M**ore than 5.5 million healthcare workers potentially are exposed to hazardous drugs (HDs) in the workplace (Bureau of Labor Statistics, 2010). Although most drugs defined as hazardous are cytotoxic agents used in the treatment of cancer, many drugs used for other indications and in other patient populations are equally unsafe. The Occupational Safety and Health Administration (OSHA) acknowledged that risk and issued recommendations for the safe handling of HDs 25 years ago (OSHA, 1986). The Oncology Nursing Society (ONS) (Polovich, Whitford, & Olsen, 2009) and the American Society of Health System Pharmacists ([ASHP], 2006) maintain published guidelines for HD safe handling. According to the National Institute for Occupational Safety and Health ([NIOSH], 2004), evidence exists that work environments are contaminated with HDs, which increases the potential for exposure of nurses, pharmacists, and other healthcare workers.

## Background

The adverse effects of occupational exposure to HDs are well documented in the literature. HD exposure is associated with acute symptoms such as hair loss, abdominal pain, nasal sores, contact dermatitis, allergic reactions, skin injury, and eye injury (Harrison, 2001; Valanis, Vollmer, Labuhn, & Glass, 1993a, 1993b). Nurses working with HDs have experienced adverse reproductive outcomes, including fetal loss, miscarriage, or spontaneous abortions; infertility (Fransman et al., 2007; Martin, 2003; Valanis, Vollmer, Labuhn, & Glass, 1997); preterm births; and learning disabilities in offspring (Martin, 2003). HD exposure of nurses also has been associated with DNA damage (Fuchs et al., 1995; Yoshida, Kosaka, Tomika, & Kumagai,

**Purpose/Objectives:** To examine relationships among factors affecting nurses' use of hazardous drug (HD) safe-handling precautions, identify factors that promote or interfere with HD precaution use, and determine managers' perspectives on the use of HD safe-handling precautions.

**Design:** Cross-sectional, mixed methods; mailed survey to nurses who handle chemotherapy and telephone interviews with managers.

**Setting:** Mailed invitation to oncology centers across the United States.

**Sample:** 165 nurses who reported handling chemotherapy and 20 managers of nurses handling chemotherapy.

**Methods:** Instruments measured the use of HD precautions and individual and organizational factors believed to influence precaution use. Data analysis included descriptive statistics and hierarchical regression. Manager interview data were analyzed using content analysis.

**Main Research Variables:** Chemotherapy exposure knowledge, self-efficacy, perceived barriers, perceived risk, interpersonal influences, and workplace safety climate.

**Findings:** Nurses were well educated, experienced, and certified in oncology nursing. The majority worked in outpatient settings and administered chemotherapy to an average of 6.8 patients per day. Exposure knowledge, self-efficacy for using personal protective equipment, and perceived risk of harm from HD exposure were high; total precaution use was low. Nurse characteristics did not predict HD precaution use. Fewer barriers, better workplace safety climate, and fewer patients per day were independent predictors of higher HD precaution use. HD handling policies were present, but many did not reflect current recommendations. Few managers formally monitored nurses' HD precaution use.

**Conclusions:** Circumstances in the workplace interfere with nurses' use of HD precautions.

**Implications for Nursing:** Interventions should include fostering a positive workplace safety climate, reducing barriers, and providing appropriate nurse-patient ratios.