

# Personal Protective Equipment Use and Surface Contamination With Antineoplastic Drugs: The Impact of the COVID-19 Pandemic

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**BACKGROUND:** Surface contamination with antineoplastic drugs (ADs) is persistent. The use of personal protective equipment (PPE) is recommended to reduce exposure to ADs.

**OBJECTIVES:** This study explored the impact of the COVID-19 pandemic on nurses' PPE use and surface contamination with ADs.

**METHODS:** Demographic characteristics, PPE use, and associated factors were assessed on two inpatient oncology units where etoposide and cyclophosphamide were administered before (N = 26) and during the COVID-19 pandemic (N = 31).

**FINDINGS:** PPE use when handling contaminated excreta was significantly higher during the pandemic. Perceived risk of chemotherapy exposure was significantly associated with greater PPE use when handling AD-contaminated excreta, and conflict of interest was related to less PPE use during AD administration and handling of AD-contaminated excreta. During the pandemic, surface contamination with etoposide increased in shared areas and decreased in patient rooms.

## KEYWORDS

surface contamination; antineoplastic drugs; personal protective equipment

## DIGITAL OBJECT IDENTIFIER

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**ANTINEOPLASTIC DRUGS (ADs) ARE HAZARDOUS DRUGS** commonly used in cancer treatment. Exposure carries risks of genotoxicity, carcinogenicity, teratogenicity, reproductive toxicity, and organ toxicity (National Institute for Occupational Safety and Health [NIOSH], 2004). There is no acceptable level of exposure (Boiano et al., 2014). Surface contamination with ADs is prevalent in health care (Chabut et al., 2022; Graeve, McGovern, Arnold, & Polovich, 2017; Walton et al., 2020), with dermal contact being the most common route of exposure. Although personal protective equipment (PPE) provides essential protection (Power & Coyne, 2018), its use is suboptimal among healthcare workers in the oncology setting (Friese et al., 2019, 2020; Polovich, 2020; Walton et al., 2020). In a NIOSH study (Polovich, 2020), 15% of nurses reported wearing the recommended two pairs of gloves while handling ADs, and 38% did not always wear a gown when recommended. Nurses' PPE use can reflect organizational factors (e.g., increased workloads) (Polovich, 2020), workplace safety climate (e.g., perceived value of safety in an organization) (Graeve, McGovern, Alexander, et al., 2017), and interpersonal (e.g., peer) influences (Friese et al., 2020). Studies have documented widespread AD contamination, despite PPE use, on the nursing station desk, bedside tables and chair armrests (Graeve, McGovern, Alexander, et al., 2017), toilet seats, floors, remote controls, bed rails, and even in staff bathrooms and breakrooms where healthcare workers would not wear PPE (Crul & Simons-Sanders, 2018; Smith et al., 2019; Walton et al., 2020).

The COVID-19 pandemic began in the United States in early 2020 and raised awareness of PPE's protective benefits and availability. In settings in which ADs are administered, nurses' PPE use may have increased because of concerns related to COVID-19 transmission.

## Purpose

Limited research has assessed PPE use and associated factors, as well as surface contamination with ADs, in the oncology setting during the COVID-19 pandemic. The authors anticipated that if PPE use increased, surface contamination with ADs would be reduced. This study's purpose was to explore PPE use and surface contamination with ADs on the same two clinical units in 2018 (before the COVID-19 pandemic [BP]) and in 2020 (during the