

Two pairs of chemotherapy-tested gloves should be worn for all HD-handling activities. Change gloves every 30 minutes or immediately if damaged or knowingly contaminated. Gloves must be disposable and powder-free; made from nitrile, neoprene, or latex; and have a cuff long enough to cover the sleeves of the gown. Thickness will vary according to glove material. With chemotherapy preparation, use sterile gloves as the outer glove. (ASHP, 2006; Connor, 1999; Gonzalo-Garijo et al., 2012; NIOSH, 2008; Wallemacq, 2006)

## Chemotherapy-tested gloves

The most recent standard for HD glove testing from the ASTM is D6978-05, which replaced the older (1999) standard of ASTM F739. The following are examples of products that meet the most recent ASTM D6978 standards. Glove testing results are available from the manufacturer and printed on the box. Gloves are tested for permeability by specific chemotherapy drugs. Ensure that the selected gloves have been tested against the types of chemotherapy used in practice. (Polovich, Power, Massoomi, & Connor, 2015)

The following list includes examples of gloves meeting ASTM D6978 standards, according to testing results and information from the manufacturer. The list is limited by space considerations and is not all-inclusive. Inclusion of a product or manufacturer does not imply endorsement by ONS or any other party.



Ansel, n.d.  
**Micro-Touch® Nitra-Tex®**

**Product Code:**  
6034010/6034014



Covidien, n.d.a  
**ChemoPlus™  
Latex Gloves**

**Product Code:**  
CT0191–CT0194



Kimberly-Clark  
Professional, 2014  
**Purple Nitrile®**

**Product Code:**  
KC500

# GLOVES

Two pairs of chemotherapy-tested gloves are recommended for use with the following activities (unless noted): (NIOSH, 2008, 2014)

**Receiving and  
unpacking HDs**

**Reconstituting, admixing, and  
manipulating HDs within PEC**

**Spill cleanup**

**Administering any HD  
(single pair needed to administer intact, unit  
dose-packaged, oral chemotherapy doses)**

**Discontinuing infusions**

**Disposal of HDs**

**Sterile gloves for operating room  
use, sterile procedures, and sterile  
preparation**

**Routine cleaning**

## Selecting Gloves for Practice

When selecting gloves for practice, it is important to ensure that the product is functional and effective. Involve staff members in the product decision. Consider ordering samples of several types of chemotherapy-tested gloves, then have staff members trial the gloves in the clinical setting. Evaluate for quality, flexibility, durability, and other indicators identified by those using the gloves. Include price in the comparison.

GLOVES

Gowns used when handling chemotherapy are disposable and made of polyethylene-coated polypropylene or other laminate, lint-free, and low-permeability fabric. The gown has a solid front with long sleeves and tight/closed elastic or knit cuffs. No seams or closures are present on the front of the gown that could permit drugs to pass through. Gowns are designed for a single use and should not be re-applied after removal. (NIOSH, 2004a, 2008; USP, 2016)



### Chemotherapy-tested gowns

Although no standard exists for testing gowns for HD permeability, some manufacturers have tested their product with several antineoplastic agents. Standards used in glove testing have been applied to test gown permeability and are available by request from the manufacturer. (Harrison & Kloos, 1999; Polovich et al., 2015; Polovich, 2011; Thompson, 2012)

# GOWNS

The following list includes examples of gowns meeting NIOSH recommendations, according to testing results and information from the manufacturer. The list is limited by space considerations and is not all-inclusive. Inclusion of a product or manufacturer does not imply endorsement by ONS or any other party.

Cardinal Health, 2016  
**Poly-coated SMS  
chemotherapy gown**

**Product Code:**  
8200CG–8201CG

Covidien, n.d.b  
**Chemo-Plus™  
Poly-Coated Gown**

**Product Code:**  
CT5502–CT5505

Halyard, 2015  
**Procedure Gown for Use  
With Chemotherapy Drugs**

**Product Code:**  
69606/37284

## Selecting gowns for practice

As with glove selection, it is important to ensure that gowns are functional and effective. Encourage staff members to trial products that meet the NIOSH recommendations and practice needs.

## Gown Use

Chemotherapy gowns must be worn during the following:

- Compounding  
(no longer than 3 hours)
- Administration
- Disconnection
- Disposal of HDs
- Spill clean-up
- Handling excreta  
(NIOSH, 2008, 2014)

# GOWNS



## Respiratory Protection

Respiratory protection is needed when cleaning HD spills or when there is a risk of exposure to HD aerosols or vapors through inhalation. Protection should be worn with intravesical administration or HIPEC. Respiratory protection should be selected based on the identified hazard. Fit-tested N-95 or N-100 particle masks are sufficient for most activities. For cleaning large spills, chemical cartridge-type respirators should be used. A standard surgical mask provides no protection and is not recommended. (*Eisenberg, 2009; NIOSH, 2004b, 2006, 2015; USP, 2016*)

Activity	Type of Protection
Airborne particles <ul style="list-style-type: none"> <li>• <i>Intravesical administration</i></li> <li>• <i>Spills that can be contained within a spill kit</i></li> </ul>	Fit-tested, NIOSH-certified N95 or more protective respirator
Gasses and vapors <ul style="list-style-type: none"> <li>• <i>Unpacking HDs that are not contained in plastic</i></li> <li>• <i>HD spills larger than what can be contained in a spill kit</i></li> <li>• <i>Deactivating, decontaminating, and cleaning C-PEC</i></li> </ul>	Elastometric half-mask with a multi-gas cartridge and P100-filter. Replace filters when damaged, soiled or causing increased breathing resistance (NIOSH, 2005).

# RESPIRATORY

## Eye Protection

**Use:**

Potential for splashing, such as administration in the operating room, intravesicular administration, working above eye level, or when cleaning spills

**Section:**

Goggles are needed to provide protection against splashing to the eyes. Eyeglasses or safety glasses with side shields are not sufficient protection (NIOSH, 2008).

## Face Protection

**Use:**

Face shields used to protect against splashing

**Section:**

Use face shield in combination with goggles to provide full protection against splashing to the eyes and face.

## Head and Hair Cover

**Use:**

Used for protection from HD particulate or microbial contamination in clean rooms and other sensitive areas (NIOSH, 2008)

**Section:**

Constructed of coated materials

## Shoe Covers

**Use:**

Wear shoe covers when compounding HDs. Remove shoe covers when exiting the compounding room (NIOSH, 2008). Wear a second pair of shoe covers when entering the compounding area (USP, 2016).

## Sleeve Covers

**Use:**

Provide protection from HD residue on arms that come in contact with surfaces of the BSC (NIOSH, 2008)

**Section:**

Select disposable sleeve covers made of polyethylene-coated polypropylene or other laminate materials.

ASHP—American Society of Health-System Pharmacists; ASTM—American Society for Testing and Materials;  
BSC—biologic safety cabinet; C-PEC—containment primary engineering control; HD—hazardous drug;  
HIPEC—hyperthermic intraperitoneal chemotherapy; NIOSH—National Institute for Occupational Safety and Health;  
ONS—Oncology Nursing Society; PEC—primary engineering control; PPE—personal protective equipment;  
USP—U.S. Pharmacopeial Convention

# ADDITIONAL PPE

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