

# Toolkit for Safe Handling of Hazardous Drugs for Nurses in Oncology

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## Safe handling begins with education

**Oncology nurses have many questions about safe handling of hazardous drugs (HDs)** in the workplace and a number of resources on the subject to which to turn. This toolkit will address safety concerns for oncology nurses in a standardized way, pulling together the best available information into a quick reference format to help ensure you are meeting the most current safety standards.

Research suggests that healthcare workers who handle HDs may experience negative effects,

from skin rashes, to adverse reproductive events, to an increased risk for cancer.<sup>1</sup> Government and regulatory agencies have created safe handling guidelines, which will be referenced throughout this toolkit.

Be aware of where to find safe handling resources in your work setting. **Ask questions, be educated, and speak up.** This toolkit is a quick guide to help you find ways to advocate for, and be an active participant in, your own safety and the safety of your coworkers.



## Where do we look for standards and guidelines?

The standards, guidelines, and position statements that have been used to contribute to this toolkit include the following (see back page for complete listing of references):

- **ONS** *Safe Handling of Hazardous Drugs*, 3rd Ed (2017)
- **ONS/American Society of Clinical Oncology (ASCO)/Hematology Oncology Pharmacy Association (HOPA)** joint position statement on Ensuring Healthcare Worker Safety When Handling Hazardous Drugs (2016)
- **American Society of Health-System Pharmacists (ASHP)** Guidelines on Handling Hazardous Drugs, American Journal of Hospital Pharmacy (2006)
- **National Institute for Occupational Safety and Health (NIOSH)** Alert Preventing Occupational Exposures to Antineoplastic and Other Hazardous Drugs in Health Care Settings (2004)
- **NIOSH** List of Antineoplastic and Other Hazardous Drugs in Healthcare Settings (2016)
- **Occupational Safety and Health Administration (OSHA)** Controlling Occupational Exposure to Hazardous Drugs (2016)
- **United States Pharmacopeia General Chapter <800>** (USP <800>) Hazardous Drugs—Handling in Healthcare Settings (2016)

## What is USP <800> and how will it impact my practice?

The United States Pharmacopeial Convention is a nonprofit organization that sets standards around the quality and safety of medications. In 2016, USP released General Chapter <800>, Hazardous Drugs—Handling in Healthcare Settings, effectively making long-standing recommendations from NIOSH, ONS, OSHA, and ASHP enforceable in many states.

The standards in the United States Pharmacopeia (USP) <800> apply to all healthcare personnel at risk for exposure to HDs, addressing facility and engineering controls, spill control, cleaning, training, and documentation. To comply with USP <800> standards, your institution may need to make changes to preparation, storage, transport, administration, and disposal practices of HDs before the December 1, 2019, enforcement date.

# What drugs are considered to be hazardous?

An **HD** is a drug that meets one or more of the following characteristics<sup>2</sup>:

- Carcinogenicity
- Teratogenicity or other developmental toxicity
- Reproductive toxicity
- Organ toxicity at low doses
- Genotoxicity
- Structure and toxicity profiles of new drugs that mimic existing drugs determined hazardous by the above criteria



HDs may also be accompanied by prescribing information in the package insert that includes special handling information to protect workers handling the drugs. Chemotherapy, antiviral drugs, hormones, some bioengineered drugs, and other miscellaneous drugs are included among those considered hazardous.<sup>2</sup>

Limited research is available about the hazardous potential of novel therapies such as targeted therapy and immunotherapy.<sup>3</sup>

The NIOSH list of HDs, which is updated every two years, can be found on the NIOSH website: [www.cdc.gov/niosh](http://www.cdc.gov/niosh).

NIOSH cautions that new drugs enter the marketplace often, and the list may not be all-inclusive. ONS recommends that every institution develop and maintain a comprehensive, practice-specific list of HDs used in that setting, as well as an ongoing process for drug evaluation through current literature, product information, and safety data sheets.

## Here are a few things you can do to improve the safety of your environment:

- Use the supplies provided, and advocate for different supplies if you know the ones you have don't meet current guidelines.
- Help maintain stock to ensure supplies (such as personal protective equipment [PPE]) are available at the point of care.
- Know who your safety resources are within your department and clinic if you have questions or suggestions.

## Hazardous drug training

If you work in an area where HDs are used, it is vital that you understand the fundamental practices and precautions needed to prevent harm to patients, minimize exposure to personnel, and minimize contamination of the work and patient-care environments.<sup>4,5</sup>

Documentation of training and competency are required of all workers who may be exposed to HDs prior to working with these drugs and at least every year thereafter. Furthermore, all staff of reproductive capability must acknowledge they understand the risks of exposure to HDs.<sup>4</sup>

Introductory and annual competency reassessment programs for RNs should include content regarding principles of safe preparation, storage, labeling, transportation, and disposal of HD agents and appropriate use and disposal of PPE. Safe handling education should be designed to improve knowledge and skills, as well as attitudes.<sup>6</sup>

Some nurses, even though they are knowledgeable about HD exposure and safe handling precautions, may not perceive that they are personally vulnerable to the associated health risks (e.g., “I have been doing this for years without wearing a gown and I am fine,” or “I am past my childbearing years”). For example, a nurse might choose to wear a lab coat instead of a chemotherapy-designated gown.<sup>6</sup> Wearing a lab coat rather than a disposable gown could cause cross contamination to areas where coworkers spend time, possibly putting them at risk. Ignoring safety procedures can hurt you and can cause harm to those around you.

**It is up to you to help keep the environment safe—not only for yourself, but for your coworkers as well.**

## Exposure to hazardous drugs during pregnancy, breastfeeding, and when trying to conceive

Handling HDs may result in reproductive risk, including structural defects in a fetus; adverse reproductive outcomes, including fetal loss, miscarriage, or spontaneous abortions; infertility; and preterm births and learning disabilities in offspring of nurses exposed during pregnancy. Although consistent and thorough use of primary engineering controls and personal protective equipment when handling hazardous drugs minimizes risk of occupational exposure, it does not eliminate it.<sup>6,7</sup>



Because of the increased susceptibility for harm, an added level of protection is needed for nurses who are pregnant, breastfeeding, or actively trying to conceive.<sup>6,7</sup>

The following recommendations are made to avoid exposure during these vulnerable times<sup>8</sup>:

1. Employers have a responsibility to ensure workers understand the risks of exposure to HDs.
2. All staff involved in the handling and administration of HDs should be familiar with and adhere to local and national policies and follow safe practice with HDs using standard operating procedures.
3. Each healthcare setting should identify available options for alternative duty and educate staff of these options.
4. It is the responsibility of employees, male and female, to inform the employer if they have medical reasons to avoid exposure, such as trying to conceive, when they become pregnant, or when lactating.
5. Upon notification that a staff member has a medical reason to avoid exposure to HDs, employers should give those staff the option of alternative duties, if available.
6. For employees trying to conceive or who are pregnant, collaboration with the employee's primary care physician and obstetrician/gynecologist should be part of the decision-making process.
7. Though the risk of exposure may be lower for non-nursing personnel such as ancillary staff, risk still exists. All staff involved in handling and administering chemotherapy must undergo appropriate training and education for safe handling of HDs.

# Personal protective equipment (PPE) overview

PPE provides worker protection to reduce exposure to HDs. Your workplace should have policies and procedures that describe appropriate PPE to be worn when handling HDs, including during:

- Receipt, storage, and transport
- Drug compounding
- Administration
- Handling body fluids following administration
- Deactivation and/or decontamination
- Cleaning and disinfecting
- Spill management
- Waste disposal

See the NIOSH list of antineoplastic and other HDs for general guidance on PPE for possible scenarios that may be encountered in healthcare settings **(see Table 1)**.<sup>2</sup>



**Table 1: Required PPE for handling all types of HDs during different stages of use<sup>2</sup>**  
**(Recommendations from NIOSH list of antineoplastic and other hazardous drugs in**  
**healthcare settings, 2016).**

Type of use	PPE needed	Notes
Receiving, unpacking, and placing drugs in storage	<ul style="list-style-type: none"> <li>• Single chemotherapy gloves</li> <li>• If leaks/spills are possible:               <ul style="list-style-type: none"> <li>◦ Protective chemotherapy gown</li> <li>◦ Respiratory protection</li> </ul> </li> </ul>	Single gloves may be used unless spill occurs.
Preparation of drug within a Containment Primary Engineering Control (C-PEC), including cutting, crushing, handling uncoated tablets, and compounding oral, topical, inhaled, subcutaneous (SC), IV, intramuscular (IM), solutions, or aerosols	<ul style="list-style-type: none"> <li>• Double chemotherapy gloves</li> <li>• Protective chemotherapy gown</li> <li>• Shoe covers</li> <li>• Head/hair cover</li> </ul>	Healthcare personnel should avoid manipulating HDs, such as crushing tablets or opening capsules, if possible. If crushing tablet(s) or opening capsule(s) is required for a single dose when a C-PEC is not available, personnel must don appropriate PPE and use a plastic pouch to contain any dust or particles generated.
Administration of all drug formulations including oral, topical, inhaled, SC, IV, IM solutions or aerosols, EXCEPT intact tablets/capsules**	<ul style="list-style-type: none"> <li>• Double chemotherapy gloves</li> <li>• Protective chemotherapy gown</li> <li>• Eye/face protection               <ul style="list-style-type: none"> <li>◦ If risk of emesis, or if liquid could splash</li> <li>◦ Always use with solution for irrigation and aerosol treatment</li> </ul> </li> <li>• Respiratory protection               <ul style="list-style-type: none"> <li>◦ If inhalation potential</li> <li>◦ Always use with solution for irrigation and aerosol treatment</li> </ul> </li> </ul>	**For intact tablets or capsules ONLY, one pair of chemotherapy gloves can be used with no other PPE, unless there is a risk of emesis.
Disposal, cleaning, spills, and exposure to the excreta of patients receiving drugs	<ul style="list-style-type: none"> <li>• Double chemotherapy gloves</li> <li>• Protective chemotherapy gown</li> <li>• Eye/face protection               <ul style="list-style-type: none"> <li>◦ If liquid could splash</li> <li>◦ Always use for spills</li> </ul> </li> <li>• Respiratory protection               <ul style="list-style-type: none"> <li>◦ If inhalation potential</li> <li>◦ Always use for spills</li> </ul> </li> </ul>	

# Selecting the best PPE for your workplace

When your institution is considering what types of PPE to purchase, insist on the right equipment. See **Table 2** for helpful considerations for selecting appropriate PPE.

## PPE FAQ

**If it is hard to maintain dexterity, and you are using chemotherapy-tested latex gloves, do you still need to double glove? Yes.** Double gloves have been shown to decrease exposure to HDs. Chemotherapy-tested gloves are available in several materials, and you should test several brands to find ones that meet the appropriate standards for quality, dexterity, efficiency, and price to determine the best product for your workplace.



**Table 2: Selecting appropriate PPE** <sup>1,4,6</sup>

PPE type	Selection criteria
Gloves	<ul style="list-style-type: none"> <li>• Chemotherapy gloves (as tested to American Society for Testing and Materials International (ASTM) standard D6978, or its successor) should be used for all HDs</li> <li>• Powder-free gloves should be made of nitrile, polyurethane, neoprene, or latex material; polyvinyl chloride is not recommended</li> </ul>
Gowns	<ul style="list-style-type: none"> <li>• Disposable, lint free, and rated to resist chemotherapy</li> <li>• Do not use cloth laboratory coats, scrubs, or isolation gowns</li> <li>• Should have long sleeves and elastic or knit cuffs, fasten in the back (no open front), and be without seams or closures that could allow HD exposure</li> <li>• Polyethylene-coated polypropylene or other laminate is recommended</li> </ul>
Eye/face shields	<ul style="list-style-type: none"> <li>• To be worn any time there is a risk of splashes or spills (e.g., working above eye level, cleaning spills, surgery, bladder treatments), including disposal of contaminated body fluids</li> <li>• Goggles should be worn with face shields when full eye and face protection is needed</li> </ul>
Respirators	<ul style="list-style-type: none"> <li>• For most activities requiring respiratory protection, a fit-tested, NIOSH-certified, N95 or more protective respirator is sufficient for airborne particles; however, N95 respirators offer no protection against gases and vapors</li> <li>• An appropriate full-facepiece, chemical cartridge-type respirator or powered air-purifying respirator (PAPR), should be worn when there is a risk of respiratory exposure to HDs, including large spills and known risk of exposure to vapors and gases             <ul style="list-style-type: none"> <li>◦ These are the currently known HDs with the potential to vaporize at room temperature<sup>6</sup>:                 <ul style="list-style-type: none"> <li>- Carmustine</li> <li>- Cisplatin</li> <li>- Cyclophosphamide</li> <li>- Etoposide</li> <li>- 5-fluorouracil</li> <li>- Ifosfamide</li> <li>- Nitrogen mustard</li> <li>- Thiotepa</li> </ul> </li> </ul> </li> <li>• Surgical masks do not provide protection against HD exposure</li> </ul>
Shoe, sleeve, and hair/facial hair covers (if needed)	<ul style="list-style-type: none"> <li>• Lint free</li> <li>• Made of disposable materials</li> <li>• Sleeve covers should be polyethylene-coated polypropylene or other laminate, with closed cuffs and no seams, openings, or closures that would allow exposure</li> </ul>

## PPE safety:

Consider these ways to help avoid exposure and cross contamination<sup>1,4,6</sup>:

- Do not wear contaminated gloves to use the phone, type on a computer keyboard, program IV pumps, open doors and cabinets, or touch body parts (e.g., face, adjusting a mask)
- Inspect PPE for defects or tears before use
- Do not reuse gloves, gowns, shoe covers, or any other disposable PPE
- Change gloves after 30 minutes of wear, if damaged, or contaminated
- Change gowns when leaving the handling area, after a spill or splash, or after two to three hours of continuous use
- Remove shoe covers when leaving compounding area or after cleaning a spill
- Do not use eyeglasses as your sole means of eye protection; use goggles with side shields or a face shield when splashing is a possibility
- Dispose of all disposable PPE in a hazardous waste container after use
- For non-disposable PPE (i.e., respirators, eye, and face protection), decontaminate and clean after use and take care to properly dispose of the materials used to decontaminate this equipment

### CLOSED-SYSTEM TRANSFER DEVICE (CSTD) FAQ

**Do I still need to wear PPE if a CSTD is being used? Yes.** CSTDs are not designed to take the place of PPE. For your safety, appropriate PPE should be used even with a CSTD.

**What do I do if no CSTD is available for the administration route?** Administration into certain organs or body cavities (e.g., eye, peritoneal cavity, chest cavity) often requires equipment for which locking connections may not be readily available or possible, and additional PPE may be required in these cases.<sup>3</sup>

# Closed system transfer devices

## What is a CSTD?

A CSTD is "a drug transfer device that mechanically prohibits the transfer of environmental contaminants into the system and the escape of HD or vapor concentrations outside the system."<sup>1</sup> (p. 44) CSTDs are designed to protect the sites prone to leakage during HD compounding and administration activities.<sup>6</sup> In theory, CSTDs should provide completely dry connections from compounding through disconnection and disposal.<sup>9</sup>

### Two major benefits of a CSTD<sup>6</sup>:

1. Prevents the release of aerosols, vapors, and droplets into the environment
  - Protects the individual working with HDs
  - Decreases surface contamination of HDs
2. Prevents environmental contaminants from entering into the system

## How do CSTDs affect my workplace?

USP <800> recommends that CSTDs are used when compounding. CSTDs are required for use in administration when the dosage form allows.<sup>4</sup> If you are not already using CSTDs, you will need to incorporate them under USP <800> criteria, which may be a significant change in practice.

Many possible CSTD combinations exist depending on the device and tubing configuration. Evaluate options, and choose the one that works well for your environment. Though the U.S. Food and Drug Administration (FDA) has not yet approved testing standards for CSTDs, products can be evaluated based on independent, peer-reviewed studies available in the literature. The CSTD manufacturer(s) of your chosen device(s) should help provide education so that every staff member who prepares or administers HDs is familiar with correct use of the device.



## Post-treatment care

Most drugs are excreted in body fluids within 48 hours of administration. All personnel responsible for handling excreta, including urine, emesis, blood, and feces, from patients who have received HDs in the past 48 hours should follow appropriate precautions.

### Time Precautions

The majority of HDs are excreted within 48 hours of administration. However, information is not available for all drugs, and some continue to be present in urine and stool for up to 7 days.<sup>6</sup>

### Required PPE

PPE, consisting of a gown and two pairs of HD-tested gloves, should be worn when handling body fluids of patients within 48 hours of drug administration. A face shield should be worn if splashing is likely.<sup>6</sup> PPE should be discarded after each use or immediately when knowingly contaminated. Hands should be washed with soap and water after removal of gloves or immediately after contact with the above substances.<sup>10</sup>

### Linen Handling

PPE should be worn when handling bed linens and towels contaminated by an HD spill or by body fluids following HD administration. In healthcare settings, linens contaminated with body fluids should be double bagged with a specially marked linen bag inside and an impervious bag on the outside. At the laundry facility, OSHA recommends the outer impervious bag be removed and discarded after the inner bag containing the contaminated linens is placed directly into the washing machine. The laundry bag and contents should be prewashed alone before a second washing with other laundry.<sup>6</sup>

### Reusable Items

Glassware or other reusable items contaminated with HDs should be washed twice with detergent by a trained employee wearing PPE as described in the PPE section.

# Day-to-day cleaning

Although no single standard exists for all settings, best practices regarding deactivation, decontamination, cleaning, and disinfection to maintain safety around HDs include:

- All areas where HDs are handled and all reusable equipment and devices must be deactivated, decontaminated, and cleaned. Additionally, sterile compounding areas and devices must be subsequently disinfected.<sup>4</sup>
- Clean work surfaces with an appropriate deactivation agent (if available) and cleaning agent before and after each activity and at the end of the work shift.<sup>1</sup>
- Institutions should create written standards of practice (SOPs) for cleaning areas where HDs are handled.

**Table 3: Cleaning steps, purpose and example agents<sup>4</sup>**

Cleaning step	Purpose	Example agents
Deactivation	Render compound inert or inactive	As listed in the HD labeling or other agents which may incorporate Environmental Protection Agency (EPA)-registered oxidizers (e.g., peroxide formulations, sodium hypochlorite, etc.)
Decontamination	Remove HD residue	Materials that have been validated to be effective for HD decontamination, or through other materials proven to be effective through testing, which may include alcohol, water, peroxide, or sodium hypochlorite
Cleaning	Remove organic and inorganic material	Germicidal detergent
Disinfection (for sterile manipulations)	Destroy microorganisms	EPA-registered disinfectant and/or sterile alcohol as appropriate for use



## Wipe testing

If wipe testing is not currently part of the routine surveillance in your facility, it will need to be added per USP <800> standards<sup>4</sup>:

- Environmental wipe sampling for HD surface residue should be performed routinely (e.g., initially as a benchmark and at least every six months, or more often as needed, to verify containment).
- Surface wipe sampling should include multiple sites in both the drug preparation and administration areas.
- The goal of wipe testing is to look for common marker HDs such as cyclophosphamide, ifosfamide, methotrexate, fluorouracil, and platinum-containing drugs.
- If measurable contamination is found, the designated person must identify, document, and contain the cause of the contamination.<sup>4</sup> This could include:
  - Reevaluating work practices
  - Retraining personnel
  - Performing thorough deactivation, decontamination, and cleaning
  - Improving engineering controls
- Once these steps have been taken, wipe testing should be repeated to ensure the steps were effective.



# Spill management

The following are generally recommended spill management guidelines. However, you should be sure to check your organization's SOPs for other procedures you may need to follow.

Recommended spill management guidelines<sup>1,4,6</sup>:

- Even a small-volume spill should be considered a source of exposure and handled appropriately.
- The longer the delay in cleaning a spill, the lower the cleaning effectiveness, so the quicker a spill is cleaned, the more effective the decontamination process will be.
- Only personnel who are properly trained in spill management and the use of PPE and NIOSH-certified respirators should be handling spill management. Organizations may choose to use a hazardous material response team for large-volume HD spills.
- All workplaces should have written SOPs that cover the important points around spill management, including:
  - PPE required for various spill sizes
  - Location of spill kits (including capacity of kits), cleanup materials, and signs to be posted; these should be located in all areas where HDs are routinely handled and should be made available if HDs are being prepared or administered in a non-routine area
  - Restricting access to areas where HD spills have occurred to decrease the risk of spreading contamination
  - Appropriate use of full-facepiece, chemical cartridge-type respirators (PAPRs) if the capacity of the spill kit is exceeded or if airborne exposure to vapors or gases is known or suspected
  - Required documentation around the circumstances and management of spills
- All spill cleanup materials should be disposed in accordance with environmental regulations regarding hazardous waste, not in a biohazard container<sup>1</sup>
- Personnel who are potentially exposed during the spill or spill clean up or who have direct skin or eye contact with HDs require immediate evaluation. Non-employees exposed to an HD spill should follow institutional policy, which may include reporting to the designated emergency service for initial evaluation and completion of an incident report or exposure form.

## Spill Management (cont.)

**Figure 1: Spill management<sup>6</sup>**

1	Assess the exposure of any individuals involved and isolate them from the spill. If an individual's clothing or skin has made contact with the hazardous agent, immediately remove the contaminated clothing and wash the skin with soap and water.
2	Immediately evacuate patients and personnel from the area.
3	All individuals involved with the spill cleanup must don HD-tested PPE, including double gloves, gown, and respiratory and face protection.
4	Wear a NIOSH-approved respirator; standard paper surgical masks are ineffective.
5	Contain the spill using plastic-backed absorbent sheets or spill pads.
6	If possible, obtain assistance from another trained person who can hold the spill waste disposal bag. This will prevent contamination of the bag when discarding absorbent pads and other materials inside.
7	Place pads or towels into the waste disposal bag, avoiding contamination of the opening of the bag.
8	Spills originating from chest or waist height can cause droplets to spread several feet from the source. Evaluate the extent of these droplets by moving away from the spill and checking under patient beds, carts, and tables, using a good light source to ensure the entire spill is cleaned.
9	Avoid touching any other parts of the environment during spill cleanup because gloves will most likely be contaminated.
10	Use a commercially available deactivation product for drugs that have been tested. If no information is available, consider a bleach solution, based on the surface, and a detergent solution to clean the spill. Begin with the least contaminated area and finish with the most contaminated area to prevent spreading of the spilled drug to non-contaminated areas.
11	Rinse area with plain water. Adequate dilution of HD residue is necessary to ensure that drug and any chemical residue has been removed and transferred to the wipes.
12	Discard all material used in cleanup in an HD waste bag. Seal the waste bag and place it in a puncture-proof container designated for HD waste.
13	After handling and disposal of HDs, remove the outer gloves, turning them carefully inside out to avoid touching the outside.
14	If a face shield was worn, remove that next, but avoid contact with the front of the shield as it may be contaminated.

15	Remove the gown, using care to pull it away from the body, not pulling it over the head, to avoid transfer of contamination to clothes and skin. Turn the gown inside out and fold it tightly and discard it.
16	Next, remove the inner gloves and discard in the disposal container, then wash hands with soap and water.
17	The final step in removal of PPE, after hand washing, is removal of the respirator/mask, avoiding touching the facepiece. Wash hands again if contaminated during removal of the respirator.

## Spill kits

Spill kits should be kept in areas where HDs are handled. Commercially available kits generally include some or all of the following <sup>6,11</sup>:

- Absorbent plastic-backed sheets or spill pads
- Disposable chemotherapy-resistant gowns (with back closure)
- Chemical-resistant shoe covers
- Two pairs of chemotherapy gloves
- Chemical splash goggles
- NIOSH-approved respirator masks
- Disposable scoop
- Plastic disposable brush
- Puncture-proof container to use if glass fragments are present
- Large heavy-duty hazardous drug waste sealable disposal bag
- Hazardous waste label (if bags are unlabeled)

\* N95 or N100 suitable for aerosols and particulates only. Chemical cartridge respirator or powered air-purifying respirator designated OV/CN/CS is required for drugs that potentially vaporize at room temperature and powder.

This may not include everything needed in the event of a spill (for example, you may need to add other items specific to the home care environment). It's important to note that some of these contents degrade over time or expire and may need to be replaced on a regular basis. Also, it may make sense to create custom kits for staff members on the spill response team with an appropriately fit-tested mask (as not all masks fit all people equally).

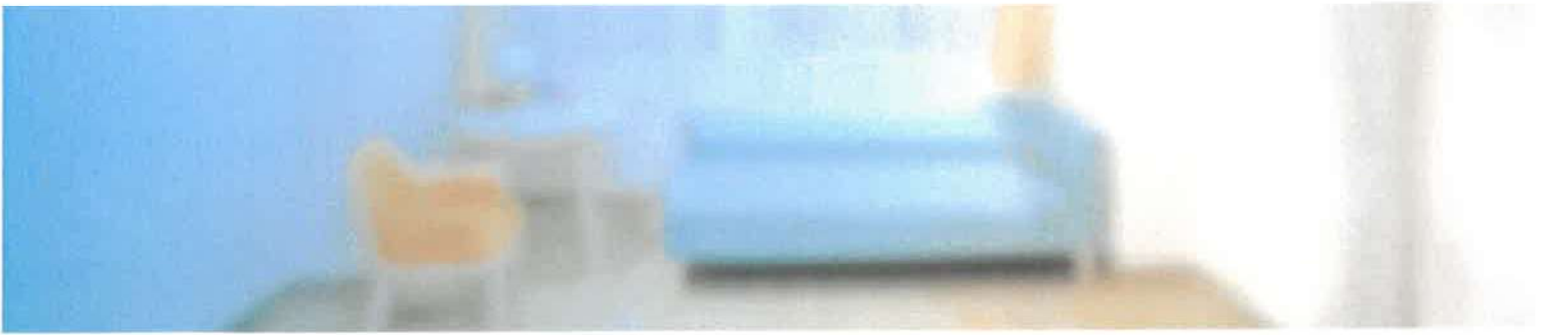
## Safe handling in the home

When HDs are prepared, stored during travel, or administered in non-acute care settings such as patient homes, it is important to maintain safe practices.

Patients and home caregivers will probably have many questions, and you can be a resource to help answer these. Below are some frequently asked questions by patients and home caregivers:

### Home caregiver FAQs

- **Do other members of the household need to use a different bathroom?** Family members should use separate toilets from the patient for 48 hours after HD administration to eliminate the risk of contact with contaminated body waste. In households with only one bathroom, patients can keep disinfecting sanitizing wipes near the toilet to clean the toilet seat and rim after use. The wiping action physically removes HD residue from surfaces. Following toileting and cleaning, patients should wash their hands with soap and water before touching other surfaces or items. At the end of 48 hours, the toilet and bathroom floor should be washed.<sup>6</sup>
- **Should caregivers wear gloves when administering medication?** Yes. PPE is indicated for family members who participate in the care of patients during HD therapy. When assisting patients with oral HDs, family members should use “no-touch” technique (e.g., pour tablets into the cap of the container) or wear gloves for handling. When preparing and administering HDs for injection, caregivers should wear gloves.<sup>6</sup>
- **Can disposable gloves be thrown in the regular trash?** Yes. Gloves and other items that come into contact with cancer medication or bodily fluids can be thrown away in the household trash. Before putting this waste in the trash, double bag it to help make sure others don’t inadvertently come into contact with it.<sup>6</sup>
- **What should be done with the packaging the medication comes in?** Empty pill bottles from cancer drugs should not be recycled and should not be used again to store other pills or items. Before throwing them out, remove the label or completely cross out any personal information. Check with the local waste management organization for guidance on disposing of items that have come into contact with oral cancer drugs or bodily waste.<sup>6</sup>
- **What should be done with leftover medication?** Usually there should not be extra medication left over, but if there is, it needs to be disposed of as safely as possible. Never throw cancer drugs in the trash or down the drain, and don’t flush them down the toilet. Instead, ask the patient’s healthcare team if unused medication can be returned to the doctor’s office, pharmacy, or treatment center for safe disposal, or check with the local health department or the Drug Enforcement Agency’s website to find out where unused cancer drugs can be safely disposed.<sup>6</sup>



### How should a spill be handled in a home care setting?

When a spill occurs, the steps in **Figure 1** should be followed when possible, but all of these steps may not be feasible in the home, and more creative solutions may be required. Here are a few points to keep in mind for spills in home settings<sup>6</sup>:

- Nurses working in the home care setting must be trained in proper safe handling techniques and be able to provide patient education.
- Home infusion nurses who routinely provide care to patients receiving HDs may require their own respirators.
- Patients should be given a prepackaged spill kit with easy-to-follow instructions on how to clean themselves and their environment, how to dispose of contaminated materials, and to whom they should report the spill.
- Carpeting should be avoided in patient care settings when possible, but if a spill occurs on carpet, whoever cleans the spill should don PPE and appropriate respiratory protection. An absorbent powder should be used, and the area should be vacuumed to remove the dried powder. A vacuum used in spill cleanup should be equipped with a HEPA filter to contain the HD-contaminated absorbent powder and limit further environmental contamination.

# Medical surveillance

As part of a comprehensive exposure control program that includes engineering controls, safe work processes, and use of PPE, ONS recommends these high-level guidelines for medical surveillance<sup>1,4,6</sup>:

- Evaluate the protection afforded by engineering controls, other administrative controls, work processes, PPE, and staff education.
- Minimize adverse health effects for healthcare workers who handle HDs as a regular part of their job assignment.
- Gather data to establish a baseline of workers' health and provide a means of early detection if a health problem develops.
- Monitor future health through assessment and documentation of symptom complaints, physical findings, and laboratory values (such as blood count); tracking over time; and examining group data compared with data from unexposed workers to explore possible overall trends.
- Use an institution-based or contracted employee health service to perform the medical surveillance while protecting the confidentiality of the employees' personal medical information.
- Monitor the data to identify prevention failure leading to health effects; this monitoring may occur in collaboration with the employee health service.
- Develop a follow-up plan for workers who have shown health changes suggesting toxicity or who have experienced an acute exposure.
- Complete an exit examination when a worker's employment ends to document the information on the employee's medical, reproductive, and exposure histories.

**In conclusion, as with any other profession, nurses deserve to work in an environment that has been made as safe as possible, but it's also up to you to take responsibility for your own safety, and to help maintain a safe environment for your coworkers. While a perfect solution has not yet been created to address all possible risks of exposure, we hope this toolkit has been helpful to you and your organization in moving towards making your workplace safer.**

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## Additional Resources

- The ONS Oral Chemo Guide Video toolkit. available on the ONS website. is an easy-to-follow guide that includes some of the topics addressed in this toolkit regarding chemo drugs and safety: [www.onsoralchemoguide.com/#/LRQ/oct001](http://www.onsoralchemoguide.com/#/LRQ/oct001).
- ONS, ASCO, and HOPA joint position statement “Ensuring Healthcare Worker Safety When Handling Hazardous Drugs”: [www.ons.org/advocacy-policy/positions/practice/hazardous-drugs](http://www.ons.org/advocacy-policy/positions/practice/hazardous-drugs)
- The Joint Commission Resources. BD Medical Improving Safe Handling for Hazardous Drugs Toolkit goes further in depth on some of the topics in this toolkit. <https://www.jcrinc.com/safe-handling-of-hazardous-drugs/>
- The Ready for <800> website by B. Braun Medical offers a number of resources and checklists to help your institution prepare: [www.readyfor800.com/](http://www.readyfor800.com/)
- A list of state requirements for enforceability of rules from USP or NIOSH can be found at: [www.jointcommission.org/assets/1/6/Feb\\_2017\\_State\\_Compounding\\_Regulations.pdf](http://www.jointcommission.org/assets/1/6/Feb_2017_State_Compounding_Regulations.pdf). The list was current as of the creation of this document. but it is important to consult state regulatory agencies in your own state before creating a final policy to ensure you are compliant with the appropriate standards.



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