Preventing Occupational Exposures to Antineoplastic and Other Hazardous Drugs in Health Care Settings

Warning!

Working with or near hazardous drugs in health care settings may cause skin rashes, infertility, miscarriage, birth defects, and possibly leukemia or other cancers.

Health care workers who work with or near hazardous drugs may be exposed to these agents in the air or on work surfaces, clothing, medical equipment, or patient urine or feces. Hazardous drugs include those used for cancer chemotherapy, antiviral drugs, hormones, some biologic engineered drugs, and other miscellaneous drugs (see Appendix A of NIOSH Alert: Preventing Occupational Exposures to Antineoplastic and Other Hazardous Drugs in Health Care Settings for a list of hazardous drugs). The health risk depends on how much exposure a worker has to these drugs and how toxic they are.

Health care workers should take the following steps to protect themselves from hazardous drugs:

1. Be familiar with and be able to recognize sources of exposure to hazardous drugs. Sources of exposure include:
   - all procedures involving hazardous drugs (including preparation, administration, and cleaning), and
   - all materials that come into contact with hazardous drugs (including work surfaces, equipment, personal protective equipment [PPE], intravenous [IV] bags and tubing, patient waste, and soiled linens).
2. Prepare hazardous drugs in an area that is dedicated to that purpose alone and is restricted to authorized personnel.
3. Prepare hazardous drugs inside a ventilated cabinet designed to protect workers and others from exposure to hazardous drugs when developing these policies and to protect all drugs that require sterile handling.
4. When supplemental protection is needed, use PPE that is nonlinting and nonabsorbent. Examples include disposable gloves and gowns, and biorisk attenuating gowns and sleeve covers, and protective masks.

Procedures in your workplace to reduce exposures to hazardous drugs:

- Avoid skin contact by using a disposable gown made of polyethylene-coated polypropylene material (which is nonlinting and nonabsorbent). Make sure the gown has a closed front, long sleeves, and elastic or lint-closed cuffs. Do not reuse gowns.
- Wear a shield when splashes to the eyes, nose, or mouth may occur and when adequate engineering controls (such as the splash or wash on a ventilated cabinet) are not available.
- Wash hands with soap and water immediately before using personal protective clothing (such as disposable gloves and gowns) and after removing it.
- Use syringes and IV sets with Luer-Lok™ fittings for preparing and administering hazardous drugs.
- Place drug-contaminated syringes and needles in chemotherapy sharps containers for disposal.
- When supplemental protection is needed, use closed-system drug-transfer devices, glove bags, and nonabsorbent systems inside the ventilated cabinet.
- Handle hazardous wastes and contaminated materials separately from other trash.
- Clean and decontaminate work areas before and after each activity involving hazardous drugs and at the end of each shift.
- Clean up small spills of hazardous drugs immediately, using proper safety precautions and PPE.
- Clean up large spills of hazardous drugs with the help of an environmental services specialist.

Employers of health care workers should take the following steps to protect their workers from exposure to hazardous drugs:

- Make sure you have written policies about the medical surveillance of health care workers and all phases of hazardous drug handling— including receipt and storage, preparation, administration, housekeeping, decontamination and cleanup, and disposal of unused drugs, contaminated gowns and sleeve covers, and patient waste.
- Seek input from workers who handle hazardous drugs when developing these policies and other programs to prevent exposures.
- Prepare a written inventory of all hazardous drugs used in the workplace, and establish a procedure for regular review and updating of this inventory.
- Train workers to recognize and evaluate hazardous drugs and to control exposure to them.
- Provide workers who work near hazardous drugs with appropriate information and MSDSs.
- Provide a work area that is devoted solely to preparing hazardous drugs and is limited to authorized personnel.
- Provide workers who handle or work near hazardous drugs with appropriate personal protective equipment (PPE). Examples include disposable gloves and gowns, and biorisk attenuating gowns and sleeve covers, and protective masks.
- Ensure the proper use of PPE by workers.
- Provide syringes and IV sets with Luer-Lok™ fittings for preparing and administering hazardous drugs. Also provide containers for their disposal.
- Consider using closed-system drug-transfer devices and nonabsorbent systems to protect nursing personnel during drug administration.
- Periodically evaluate hazardous drugs, equipment, training, effectiveness, policies, and procedures in your workplace to reduce exposures as much as possible.

For additional information, see NIOSH Alert: Preventing Occupational Exposures to Antineoplastic and Other Hazardous Drugs in Health Care Settings (DHHS [NIOSH] Publication No. 2005–111). Single copies of the Alert are available from the following:

NIOSH—Publications Dissemination
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Telephone: (1–800–35–NIOSH (1–800–356–4674)
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Comply with all relevant U.S. Environmental Protection Agency/Resource Conservation and Recovery Act (EPA/RCRA) regulations related to the handling, storing, and transportation of hazardous waste.
Avoid skin contact by using a disposable gown made of polyethylene-coated polypropylene ma-

terial (which is nonlinting and nonabsorbent). Make sure the gown has a closed front, long 

sleeves, and elastic or knit closed cuffs. Do not 

reuse gowns.

Wear a face shield when splashes to the eyes, 

nose, or mouth may occur and when adequate 

engineering controls (such as the splash or 

wound on a ventilated cabinet) are not available.

Wash hands with soap and water immediately 

before using personal protective clothing (such 

as disposable gloves and gowns) and after re-

moving it.

Use syringes and IV sets with Luer-Lok™ fit-

tings for preparing and administering hazard-

ous drugs.

Place drug-contaminated syringes and needles 

in chemotherapy sharps containers for disposal.

When sufficient protection is needed, use closed-system drug-transfer devices, glove bags, and nonabsorbent systems inside the ventil-

ated cabinet.

Handle hazardous wastes and contaminated 

materials separately from other trash.

Clean and decontaminate work areas before 

and after each activity involving hazardous 

drugs and at the end of each shift.

Clean up small spills of hazardous drugs im-

mediately, using proper safety precautions and 

clean-up agents.

Clean up large spills of hazardous drugs with 

appropriate information and 

MSDSs.

Provide a work area that is devoted solely to 

preparing hazardous drugs and is limited to au-

thorized personnel.

Do not permit workers to prepare hazardous 

drugs using laminar-flow work stations that 

move air from the drug toward the worker.

Provide and maintain ventilated cabinets 

designed to protect workers and others from exposure to hazardous drugs and to protect 

drugs that require sterile handling. Examples 

of ventilated cabinets include biological safety 

cabinets (BSCs) and containment isolators de-

signed to prevent hazardous drugs from escap-

ing into the work environment.

Filter the exhaust from ventilated cabinets with 

high-efficiency particulate air (HEPA) filters (3M™ fi-

ters). Make sure these cabinets are exhausted to 

the outdoors wherever feasible—well away 

from windows, doors, and other air-intake lo-

cations.

Consider providing supplemental equipment 

to protect workers further—for example, glove 

bags, needleless systems, and closed-system 

drug-transfer devices.

Establish and oversee appropriate work prac-

tices for handling hazardous drugs, patient 

wastes, and contaminated materials.

Provide workers with proper PPE on the basis 
of a risk assessment and train workers how to use it—such as required by the Occupational Safety 

and Health Administration (OSHA) PPE stan-

dard (29 CFR 1910.132). PPE may include 

chemotherapy gloves, nonlinting and nonabsor-

batent disposable gowns and sleeves, and 

eye and face protection.

Ensure the proper use of PPE by workers.

Use NIOSH-certified respirators [42 CFR 84]. 

Note: Surgical masks do not provide ade-

quate respiratory protection.

Use syringes and IV sets with Luer-Lok™ 

fittings for preparing and administering haz-

ardous drugs. Also provide containers for their 

disposal.

Consider using closed-system drug-transfer 

devices and nonabsorbent systems to protect 

nursing personnel during drug administration.

Periodically evaluate hazardous drugs, equip-

ment, training effectiveness, policies, and pro-

cedures in your workplace to reduce exposures 

as much as possible.

For additional information, see NIOSH Alert: Prevent-

ing Occupational Exposures to Antineoplastic and 

Other Hazardous Drugs in Health Care Settings 

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For information about AMD, see NIOSH Alert: Prevent-

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Health care workers should take the following steps to protect themselves from hazardous drugs:

- Be familiar with and able to recognize sources of exposure to hazardous drugs. Sources of exposure include:
  - all procedures involving hazardous drugs (including preparation, administration, and cleaning), and
  - all materials that come into contact with hazardous drugs (including work surfaces, equipment, personal protective equipment [PPE], intravenous [IV] bags and tubing, patient waste, and soiled linens).

- Prepare hazardous drugs in an area that is dedicated to that purpose alone and is restricted to authorized personnel.

- Prepare hazardous drugs inside a ventilated cabinet designed to protect workers and others from exposure and to protect all drugs that require sterile handling.

- Use two pairs of powder-free, disposable chemotherapy gloves, with the outer one covering the gown cuff whenever there is risk of exposure to hazardous drugs.

- Avoid skin contact by using a disposable gown made of polyethylene-coated polypropylene material (which is nonlinting and nonabsorbent). Make sure the gown has a closed front, long sleeves, and elastic or knit closed cuffs. Do not reuse gloves.

- Wear a face shield when splashes to the eyes, nose, or mouth may occur and when adequate engineering controls (such as the splash or win-dow in a ventilated cabinet) are not available.

- Wash hands with soap and water immediately before using personal protective clothing (such as disposable gloves and gowns) and after remov-ing it.

- Use syringes and IV sets with Luer-Lok™ fittings for preparing and administering hazardous drugs.

- Place drug-contaminated syringes and needles in chemotherapy sharps containers for disposal.

- When suppositories are needed, use closed-system drug-transfer devices, gloves, bags, and nonabsorbable systems inside the ventilated cabinet.

- Handle hazardous wastes and contaminated materials separately from other trash.

- Clean and decontaminate work areas before and after each activity involving hazardous drugs and at the end of each shift.

- Clean up small spills of hazardous drugs immediately, using proper safety precautions and procedures.

- Clean up large spills of hazardous drugs with appropriate information and MSDSes.

- Use appropriate respiratory protection—such as disposable gloves and gowns, and engineering controls (such as the sash or window in a ventilated cabinet). Provide workers with proper PPE on the basis of a risk assessment and train workers how to use it—such as required by the Occupational Safety and Health Administration (OSHA) PPE standard (29 CFR 1910.132). PPE may include chemotherapy gloves, nonlinting and nonabsorbent disposable gowns and sleeves, and eye and face protection.

- Ensure the proper use of PPE by workers.

- Use NIOSH-certified respirators [42 CFR 84]. Note: Surgical masks do not provide adequate respiratory protection.

- Use syringes and IV sets with Luer-Lok™ fittings for preparing and administering hazardous drugs. Provide workers with handles for preparing hazardous drugs with appropriate information and MSDSes.

- Provide a work area that is devoted solely to preparing hazardous drugs and is limited to authorized personnel.

- Do not permit workers to prepare hazardous drugs using laminar-flow work stations that move air from the drug toward the worker.

- Provide and maintain ventilated cabinets designed to protect workers and others from exposure to hazardous drugs and to protect all drugs that require sterile handling. Examples of ventilated cabinets include biological safety cabinets (BSCs) and containment isolators designed to prevent hazardous drugs from escaping into the work environment.

- Filter the exhaust from ventilated cabinets with high-efficiency particulate air filters (HEPA fi-ters). Make sure these cabinets are exhausted to the outdoors whenever feasible—well away from windows, doors, and other air-intake locations.

- Provide adequate ventilation and housekeeping, including storage, preparation, administration, housekeeping, decontamination and cleaning, and disposal of unused drugs, contaminated gloves and gowns, and patient wastes.

- Establish and oversee appropriate work prac-tices for handling hazardous drugs, patient wastes, and contaminated materials.

- Provide workers with proper PPE on the basis of a risk assessment and train workers how to use it as required by the Occupational Safety and Health Administration (OSHA) PPE standard (29 CFR 1910.132). PPE may include chemotherapy gloves, nonlinting and nonabsorbent disposable gowns and sleeves, and eye and face protection.

- Ensure the proper use of PPE by workers.

- Develop a written inventory of all hazardous drugs used in the workplace, and establish a procedure for regular review and updating of this inventory.

- Train workers to recognize and evaluate hazardous drugs and to control exposure to them.

- Provide workers who handle or work near haz-ar-dous drugs with appropriate information and MSDSes.

- Make sure you have written policies about the medical surveillance of health care workers and all phases of hazardous drug handling—including receipt and storage, preparation, ad-ministration, housekeeping, decontamination and cleanup, and disposal of unused drugs, other hazardous spills, and patient wastes.

- Comply with all relevant U.S. Environmental Protection Agency/Resource Conservation and Recovery Act (EPA/RCRA) regulations related to the handling, storage, and transportation of hazardous wastes.

For additional information, see NIOSH Alert: Preventing Occupational Exposures to Antineoplastic and Other Hazardous Drugs in Health Care Settings (DHHS [NIOSH] Publication No. 2004-165). Single copies of the Alert are available from the following:

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- Wear a face shield when splashes to the eyes, nose, or mouth may occur and when adequate engineering controls (such as the splash or window in a ventilated cabinet) are not available.

- Wash hands with soap and water immediately before using personal protective clothing (such as disposable gloves and gowns) and after removing it.

- Use syringes and IV sets with Luer-Lok™ fittings for preparing and administering hazardous drugs.

- Place drug-contaminated syringes and needles in chemotherapy sharps containers for disposal.

- When suppository protection is needed, use closed-system drug-transfer devices, gloves, bags, and nonabsorbable systems inside the ventilated cabinet.

- Handle hazardous wastes and contaminated materials separately from other trash.

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- Consider providing supplemental equipment to protect workers further—for example, glove bags, needleless systems, and closed-system drug-transfer devices.

- Establish and oversee appropriate work practices for handling hazardous drugs, patient wastes, and contaminated materials.

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