INTRODUCTION

Purpose:
This policy has been developed to promote safe work practices for all employees who prepare or administer hazardous drugs or clean up spills of these drugs. It is important to minimize occupational exposure to these drugs because of the risk of adverse health effects. This policy was originally based on the Occupational Safety and Health Administration's Technical Manual Section on Hazardous Drugs, which has now been replaced by OSHA’s updated Controlling Occupational Exposure to Hazardous Drugs. Further information on specific drugs can be found on the UConn Health Library Medication reference sites (e.g. Micromedex, Lexicomp, etc.) or by searching for the material’s Safety Data Sheet (SDS) on any internet browser.

Definition:
- Hazardous Drug: A hazardous drug is any drug identified as hazardous or potentially hazardous by the National Institute for Occupational Safety and Health (NIOSH) on the basis of at least one of the following six criteria: carcinogenicity, teratogenicity or developmental toxicity, reproductive toxicity in humans, organ toxicity at low doses in humans or animals, genotoxicity, and new drugs that mimic existing HDs in structure or toxicity.
- NIOSH maintains a list of antineoplastic and other HDs used in healthcare settings. See Appendix A for latest update.
- Investigational drugs will be assessed for hazard potential and handled as HDs when appropriate.

Responsibilities:
Departments with employees who handle hazardous drugs on a regular basis must:
- Ensure that employees know and follow the procedures outlined in this policy. (ex: hazardous drug identification, hazards of specific drugs, spill procedures, etc.)
- Develop additional department/procedure specific written procedures as appropriate and ensure that employees follow these procedures.
- Comply with the Hazard Communication Policy 29CFR 1910.1200 as it applies to hazardous drugs. This means ensuring that employees are informed of any potential hazard, hazardous drugs are clearly identified/labeled, proper personal protective equipment is readily available and that SDSs are readily available for all drugs in liquid, powdered, and gaseous form. These topics, but not limited to, will serve as the basis of a training program.
- Develop a plan for cleaning up spills of hazardous drugs and provide spill kits to all areas where hazardous drugs are administered. (Hazardous drug spill kits are available through the Environmental Health & Safety Department). Routine sized spills of LIQUID hazardous drugs will be handled by employees in the area of the spill.
• Ensure that appropriate personal protective equipment (PPE) is available and worn by employees.

• Ensure that tasks involving hazardous drugs in powdered form are performed in the appropriate areas or in the Pharmacy.

Employees who handle hazardous drugs will:

• Comply with the procedures outlined below and with department- or site-specific procedures related to handling hazardous drugs.

• Report any exposures (skin or eye contact or inhalation of an aerosol or dust) to their supervisors and to UConn Health Occupational Medicine/Employee Health Department.

• Report spills to immediate supervisor and submit and event report via the UConn Health event reporting system (SI-Safety Intelligence) and the supervisor, in consultation with the employee, may file a “Employee Accident/Incident” report to Gallagher Bassett Services 1-800-828-2717.

Employee Health/Occupational Medicine will:

• Provide medical care/consultation to employees who have been exposed to hazardous drugs

• Provide consultation to employees who have questions about reproductive health as it relates to handling hazardous drugs.

The Environmental Health & Safety (EHS) Department will:

• Respond to spills of hazardous drugs in areas where appropriate PPE is not available.

• Provide training on the proper method and use of the spill kit.

• Respond to large spills that are beyond the capacity of employees in the vicinity of the spill. Large spills are defined as those beyond the absorption capability of the spill kits provided.

• Respond to all releases of hazardous gases.

• Provide telephone advice/assistance to any employee who will be cleaning up a spill of hazardous drugs.

• Provide hazardous waste pick up and replacement services for spills involving the drugs regulated by the EPA.

• Provide access to SDSs for hazardous drugs. These SDSs are available on UConn Health’s Library Medication reference sites (Micromedex and Lexicomp), EH&S’s website or by querying any internet search engine such as Google.
The Pharmacy will:

- Indicate (via EMR or clinical advisory) when special handling precautions are necessary.
- Ensure that hazardous drugs that will be used for patient treatment are handled in the pharmacy during all processes involving drugs in powdered or granular form. (Such processes would include reconstitution of powders and crushing of tablets.)

Respiratory Therapy will:

- Ensure that gaseous or aerosolized hazardous drugs are safely contained during administration and will communicate necessary precautions to other healthcare providers.

PROCEDURES

Handling of liquid hazardous drugs:

Equipment Needed:

Employees should wear gloves that are protective against the hazardous drug they are using.

- For chemotherapy and other hazardous drugs, employees must wear gloves tested for use with chemotherapy drugs in the appropriate size. Due to their potential mutagenic, carcinogenic and teratogenic effects occupational exposure to chemotherapy drugs should be kept to a minimum. Utilization of personnel protective devices, especially the use of protective medical gloves, is a mainstay to avoid skin contact. The choice of appropriate gloves is of outstanding importance. For optimal protection in the oncology setting it is essential to establish general guidelines evaluating appropriate materials and defining quality standards. Establishing these guidelines can facilitate better handling and avoid potential hazards and late sequelae. The implementation of uniform standards for gloves used while handling chemotherapy drugs would be desirable. Gloves used to handle chemotherapy drugs have to fulfill requirements according to the ASTM International (American Society of Testing and Materials) standard D 6978-05. Nitrile or natural rubber latex is a preferred basic glove material, while vinyl is considered inappropriate because of its generally increased permeability. For extended exposure to chemotherapy drugs, double gloving, the use of thicker gloves and the frequent change of gloves increase their protective power.

- Gloves are required during handling of hazardous drugs (e.g., drug preparation, initial administration, changing of IV bags, and discontinuation of chemotherapy and other hazardous drugs). If there is a potential for leaking or splashing, such as during compounding and administration, double gloves are required.

- If there is a potential for splashing, employees must also wear a cuffed gown that is resistant to permeability by hazardous drugs and eye protection.
Work Practices:

General:

Employees must wash their hands before donning and after removing gloves. Gloves or clothing that become contaminated must be changed as soon as possible. Contaminated bedding and/or clothing must be changed as soon as possible. Contaminated bedding and/or clothing must be handled per departmental procedures. Staff must wear PPE when handling soiled linen in the 48 hour period after a patient has received HD. Soiled linen should be placed in a leak-proof bag.

IV tubing connection sites must be taped unless they have Luer-lock fittings.

- IV sets for hazardous drugs will be prepared in pharmacy. The IV bag will be spiked and primed with a non-chemotherapy containing compatible solution in their C-PEC before hazardous drug is added to bag.

- Air will be expelled from syringes by the Pharmacy in their C-PEC. Air must not be expelled from a syringe containing a hazardous drug anywhere except in a C-PEC.

Administration:

- If a closed system transfer device (aka “chemo cap”) is not used, plastic-backed absorbent pad will be placed under the tubing during IV push administration to catch any leakage. Sterile gauze will be placed around any push sites for absorbing leakage.

- Infusion sets and pumps, which should have Luer-lock fittings, should be watched for signs of leakage during use.

Disposal: Refer to UConn Health policy on disposal of hazardous drugs by clicking: Pharmacy Policy for Pharmaceutical Waste Management.

Incidents of Spills Involving Hazardous Drugs

Incidents or spills involving hazardous drugs must be handled and reported to the appropriate departments as indicated below.

Patient, Visitor or Personnel Exposure:

Overt contamination of gloves, clothing, skin or eyes will be treated as follows:

- Remove contaminated gloves or clothing (if applicable).

- Wash the affected skin area with soap (not germicidal cleaner) and lukewarm water. (Hot water will open pores and increase skin absorption.) For eye exposure, immediately flush the affected eye with water (eyewash facilities are available on throughout campus) or isotonic eyewash designated for that purpose for at least 15 minutes.

- For direct skin or eye contact,
  - Obtain medical attention as soon as possible. Employees should go to Employee Health Services or the Emergency Department.
• Fill out the appropriate incident report form and submit as appropriate.

• Employees who are exposed must enter a UConn Health event report (Safety Intelligence) and the supervisor, in consultation with the employee, may file a “Employee Accident/Incident” report to Gallagher Bassett Services 1-800-828-2717.

• If a family member or visitor is exposed, staff member must enter a UConn Health event report (Safety Intelligence).

• Notify the appropriate area manager or supervisor.

Other Incidents during patient treatment:
Whether there is an exposure or not, any incident involving a hazardous drug should be documented in a UConn Health event report (Safety Intelligence).

Spills of liquid hazardous drugs:
• For information about the hazards of the spilled drug, contact the area pharmacy or use the UConn Health Library online medication resources (e.g. Micromedex, Lexicomp, etc).

• Whenever possible, spills of LIQUID hazardous drugs will be handled by employees in the area of the spill.

• Employees may contact Environmental Health & Safety for telephone advice or assistance cleaning up the spill. Environmental Health & Safety will respond to large spills that are beyond the capacity of the spill kit or the employee(s) in the vicinity of the spill.

Handling and Spills of Powered or Aerosolized Hazardous Drugs: Reconstitution and/or manipulation of powdered/aerosol hazardous drugs will occur only in the pharmacy or in pharmacy med rooms. These areas must follow safety procedures and any special spill clean-up procedures.

Training
Supervisors of employees who handle hazardous drugs must make their employees aware of the potential health effects of these drugs, as required by OSHA’s Hazard Communication Standard. The supervisor should refer to the SDS for information about the hazards. The supervisor must also communicate and enforce proper handling procedures, and must advise employees on how they are to handle emergencies, including personnel exposure and spills. Environmental Health & Safety can assist with this training effort.
Appendix A:

**UConn Health Hazardous Drug List**

This list is based on the NIOSH List of Antineoplastic and Other Hazardous Drugs in Healthcare Settings, 2016, DHHS (NIOSH) Publication No. 2016-161 (Sept. 2016) as well as additional drugs deemed hazardous based on an internal hazard assessment.

Periodic updates to the NIOSH list can be found at: [https://www.cdc.gov/niosh/topics/hazdrug/](https://www.cdc.gov/niosh/topics/hazdrug/).

For drugs which are hazardous if the dosage form is altered: crushing, breaking, splitting, or otherwise modifying the drug from its intended, stable dosage form, requires the individual preparing or administering the drug to wear gloves and a protective gown. See Table 2 for more information.

Drugs undergoing review for addition to the UConn Health Formulary are formally evaluated according for hazardous drug criteria. This information is presented to the appropriate Formulary Evaluation Team and subsequently the Pharmacy & Therapeutics Committee. When a hazardous drug is added to formulary, it is subsequently added to the UConn Health Hazardous Drug List.

UConn Health’s Formulary waste determination completed by *Stericycle*
Table 2: NIOSH list of possible scenarios where hazardous drugs are handled and the suggested personal protective equipment and engineering controls

<table>
<thead>
<tr>
<th>Formulation</th>
<th>Activity</th>
<th>Double Chemotherapy Gloves</th>
<th>Protective Gown</th>
<th>Eye/ Face protection</th>
<th>Respiratory Protection</th>
<th>Ventilated Engineering Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>All types of hazardous drug</td>
<td>Receiving, unpacking, and placing in storage</td>
<td>No (single glove can be used, unless spill occurs)</td>
<td>Yes, when spills and leaks occur</td>
<td>No</td>
<td>Yes, when spills and leaks occur</td>
<td>No</td>
</tr>
<tr>
<td>Intact tablet or capsule</td>
<td>Administration from unit-dose package</td>
<td>No (single glove can be used)</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>Tablet or capsule</td>
<td>Cutting, crushing or otherwise manipulating tablets or capsules; handling uncoated tablets</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes, if not done in a controlled device</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Administration</td>
<td>No (single glove can be used)</td>
<td>No</td>
<td>Yes, if vomit or potential to spit up‡</td>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>Oral liquid drug or feeding tube</td>
<td>Compounding</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes, if not done in a control device</td>
<td>Yes, if not done in a control device</td>
<td>Yes†</td>
</tr>
<tr>
<td></td>
<td>Administration</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes, if vomit or potential to spit up</td>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>Formulation</td>
<td>Activity</td>
<td>Double Chemotherapy Gloves</td>
<td>Protective Gown</td>
<td>Eye/Face protection</td>
<td>Respiratory Protection</td>
<td>Ventilated Engineering Controls</td>
</tr>
<tr>
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</tr>
<tr>
<td>Topical drug</td>
<td>Compounding</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes, if not done in a control device</td>
<td>Yes, if not done in a control device</td>
<td>Yes, BSC or CACI (Note: carmustine and mustargen are volatile)</td>
</tr>
<tr>
<td></td>
<td>Administration</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes, if liquid could splash</td>
<td>Yes, if inhalation potential</td>
<td>N/A</td>
</tr>
<tr>
<td>Subcutaneous, intramuscular injection from a vial</td>
<td>Preparing (withdraw from vial)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes, if not done in a control device</td>
<td>Yes, if not done in a control device</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Administration from prepared syringe</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes, if liquid could splash</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Withdrawing and/or mixing Intravenous or intramuscular solution from a vial or ampoule</td>
<td>Compounding</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Administration of prepared solution</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes, if liquid could splash</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Solution for irrigation</td>
<td>Compounding</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes, if not done in a control device</td>
<td>Yes, if not done in a control device</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Administration (bladder, HIPEC, limb perfusion, etc)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Powder/Solution for inhalation/Aerosol treatment</td>
<td>Compounding</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes, if not done in a control device</td>
<td>Yes, if not done in a control device</td>
<td>Yes, BSC or CACI;</td>
</tr>
<tr>
<td></td>
<td>Aerosol administration</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes, when applicable</td>
</tr>
<tr>
<td></td>
<td>Administration</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes, if liquid could splash</td>
<td>Yes, if inhalation potential</td>
<td>N/A</td>
</tr>
<tr>
<td>Formulation</td>
<td>Activity</td>
<td>Double Chemotherapy Gloves</td>
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</tr>
<tr>
<td>Drugs and metabolites in body fluids</td>
<td>Disposal and cleaning</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes, if liquid could splash</td>
<td>Yes, if inhalation potential</td>
<td>N/A</td>
</tr>
<tr>
<td>Drug contaminated waste</td>
<td>Disposal and cleaning</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes, if liquid could splash</td>
<td>Yes, if inhalation potential</td>
<td>N/A</td>
</tr>
<tr>
<td>Spills</td>
<td>Cleaning</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
</tr>
</tbody>
</table>
References


4. USP [2016]. USP General Chapter <800> Hazardous Drugs—Handling in Healthcare Settings.


7. Occupational Safety and Health Administration guidelines “Controlling Occupational Exposure to Hazardous Drugs”

NOTE: NIOSH will develop a final list of drugs to be placed on the NIOSH List of Antineoplastic and Other Hazardous Drugs in Healthcare Settings, 2018. The 2018 Update will be published on the NIOSH website and announced in a Federal Register notice.