



DEPARTMENT OF THE NAVY

BUREAU OF MEDICINE AND SURGERY
2300 E STREET NW
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IN REPLY REFER TO
BUMEDINST 6570.3
BUMED-M3B63
8 May 2008

BUMED INSTRUCTION 6570.3

From: Chief, Bureau of Medicine and Surgery

Subj: HAZARDOUS DRUGS SAFETY AND HEALTH PLAN

Ref: (a) OSHA Technical Manual TED 1-0.ISA, Section VI, Chapter 2
(b) 29 CFR 1910.133, Eye and Face Protection
(c) 29 CFR 1910.1030, Bloodborne Pathogens Standard
(d) 29 CFR 1910.1200, Hazard Communication Standard
(e) 49 CFR part 172.101, Purpose and Use of Hazardous Materials Table
(f) ANSI Z358.1-2004, Emergency Eyewash and Shower Equipment
(g) NEHC-6260 TM OM-6260, Medical Surveillance Procedures Manual and Medical Matrix, Current Edition
(h) OPNAVINST 5100.23G
(i) OPNAVINST 6000.1C
(j) NEHC TM-OEM 6260.01A Reproductive and Developmental hazards: A Guide for Occupational Health Professionals, April 2006

Encl: (1) Common Drugs Considered Hazardous by the Occupational Safety and Health Administration (OSHA)
(2) EPA-Regulated Hazardous Drugs

1. Purpose. To provide policy and guidelines for Bureau of Medicine and Surgery (BUMED) activities in controlling occupational exposures to hazardous drugs (HDs), as defined by the American Society of Health-System Pharmacists (ASHP) and as discussed in paragraph 4a below, including cytotoxic drugs (CDs) per references (a) through (d).

2. Cancellation. NAVMEDCOMINST 6570.1 and S/N 0510-LD-051-8825.

3. Scope. This instruction applies to all settings where personnel may be occupationally exposed to HDs.

4. Background

a. A number of pharmaceuticals in the health care setting may pose an occupational risk to employees through acute and chronic workplace exposure. Preparation, administration, and disposal of HDs may expose pharmacists, nurses, physicians, other health care workers, and housekeeping staff to potentially significant levels of these chemicals. The main routes of exposure are: inhalation of dusts or aerosols, dermal absorption, ingestion, self-inoculation, or contact with excreta from patients treated with these drugs. The ASHP has defined a class of agents as HDs based on the following drug characteristics: genotoxicity, carcinogenicity, teratogenicity or fertility impairment, and serious organ or other toxic manifestation at low doses in experimental animals or treated patients.

b. Enclosure (1) lists some common drugs that are considered hazardous by OSHA. Enclosure (2) lists the Environmental Protection Agency (EPA) regulated hazardous drugs.

5. Responsibilities. Commanding officers or officers in charge of any activity rendering health care or handling HDs must:

a. Appoint a hazardous drug officer (who is a nurse or pharmacist) and, if appropriate, establish a Hazardous Drug Committee or a joint Hazardous Drug/Hazardous Materials Committee.

b. Develop a Hazardous Drug Safety and Health Plan as described in reference (a), section VI, chapter 2, paragraph V.A.2. This plan must be reviewed and its effectiveness reevaluated at least annually and updated as necessary.

6. Procedures

a. HD Preparation Precautions

(1) HD preparation must be performed in an area with access limited to authorized personnel only. Eating, drinking, smoking, chewing gum, applying cosmetics, and storing food in the preparation area must be prohibited. Procedures for spills and emergencies must be posted in the preparation area.

(2) Only Class II, Type B or Class III, Biological Safety Cabinets (BSC) that meet the current National Sanitation Foundation Standard or negative pressure Containment Aseptic Isolators (CAI) that meet International Standards Organization (ISO) 14644 Class 5, Air Quality Standards must be designated for preparation of HDs. Internal and external exhausts for the hoods must have HEPA filters. Pharmacies that compound one or fewer HD per day on average may use a negative pressure CAI that is not externally vented only if a secondary engineering control such as a closed system transfer device is used in addition to the hood for compounding. All HDs other than commercially available oral dosage forms must be prepared in designated hoods. When possible, using a dedicated BSC for HD's is prudent practice. Refer to paragraph 6a(7) below for guidance in preparation of commercially available oral HD products.

(3) The exhaust fan or blower on the hood must be on at all times, except when the hood is being mechanically repaired or moved. If the blower is turned off, the hood must be decontaminated before reuse. Any time the cabinet is turned off or transported, it should be sealed with plastic. Each hood must be equipped with a continuous monitoring device to allow confirmation of adequate airflow and cabinet performance. Ensure that outside exhaust of the hoods is vented away from air intake units. Backup (emergency) electrical power must be available and automatically engaged when needed.

(4) The cabinet must be cleaned/decontaminated as frequently as the manufacturer's instructions recommend, but at least weekly, as well as whenever spills occur, or when the

cabinet requires moving, service, or certification. Decontamination must consist of surface cleaning with water and detergent followed by thorough rinsing. Do not use spray cleaners or germicidal fumigants. During the cleaning, the worker should wear personal protective equipment (PPE) similar to that used for spills. Ideally, the sash on BSCs should remain down during cleaning; however, a National Institute of Occupational Safety and Health (NIOSH)-approved respirator appropriate for the hazard must be worn by the worker if the sash will be lifted at any time during the process. Cleaning should proceed from least to most contaminated areas. The drain spillage trough area should be cleaned at least twice since it can be heavily contaminated. All materials from the decontamination process must be handled as HDs and disposed of following Federal, State, and local laws.

(5) Hoods that are being used must be serviced and certified by a qualified technician as recommended by the manufacturer, but not less frequently than every 6 months and any time the cabinet is moved or repaired. HEPA filters should be changed when air flow is restricted (as indicated by the continuous monitor), or when the filters are contaminated by an accidental spill.

(6) All contaminated needles, syringes, and intravenous (IV) tubing used to prepare HDs will be disposed of intact. **CLIPPING, CRUSHING, OR RECAPPING IS PROHIBITED.** Priming IV sets or expelling air from syringes should be carried out in the designated hood. If done at the administration site, the line will be primed with a non-drug containing solution or a back-flow closed system must be used. Filter needles are recommended to prevent the aerosolization of HDs during the preparation process. IV containers with venting tubes should not be used.

(7) The handling of non-liquid forms of HDs requires special precautions. HD tablets which may produce dust or potential exposure to the handler should be counted in a hood. Nonsterile fume hoods that are vented to the outside may be used for oral dosage forms in lieu of an aseptic hood. Special work practices should be followed when handling these HDs to ensure tablets and capsules are not crushed or broken. Automated counting devices are discouraged unless the process is enclosed and isolates the hazard from the employees. Trays and counting equipment should be cleaned with alcohol. Counting equipment (whether done by hand or automated) should be dedicated to HDs only.

b. Transportation and Storage

(1) In addition to standard pharmacy labeling practices, all syringes and IV bags containing HDs should be labeled with a distinctive warning label, such as: **CYTOTOXIC AGENT/ DISPOSAL PRECAUTIONS.** EPA regulated HDs, covered under the Hazard Communication Standard, reference (d), and listed in enclosure (2), must also have labels following the standard to warn personnel of the hazards associated with handling these drugs.

(2) Access to areas where HDs are stored should be limited to authorized personnel, with signs restricting entry. A list of drugs covered by HD policies and information on spill and emergency contact procedures should be posted or easily available to staff. Optimally, facilities

used for storing HDs should not be used for other drugs. These facilities should also be designed to prevent containers from falling to the floor (e.g., bins and shelves with barrier fronts). Warning labels should be applied to all HD containers, as well as the bins and shelves where these containers are stored.

(3) Transport must occur in sealed plastic bags and in containers to avoid breakage. Shipped HDs that are subject to EPA regulation as hazardous waste are also subject to Department of Transportation (DOT) regulations as specified in reference (e). Personnel involved with transporting HDs should be trained in spill procedures (see paragraph 6g).

c. Drug Administration. Only appropriately qualified/certified personnel will administer HDs.

(1) Gloves, goggles, gowns, and other PPE as described in paragraph 6d of this instruction must be worn when administering HDs. Preparation for administration of HDs on the ward or clinic will be carried out on trays lined with a plastic-backed absorbent pad (Chux) so that at the end of the procedure the plastic can be gathered as waste for appropriate disposal.

(2) Contaminated needles, syringes, and IV tubing will be disposed of intact. CLIPPING, CRUSHING, OR RECAPPING IS PROHIBITED. Only when a procedure specifically requires recapping, the one-handed method will be used.

(3) The administration of aerosolized HDs requires special engineering controls to prevent exposure to health care workers and others in the vicinity. In the case of pentamidine, these controls include treatment booths with local exhaust ventilation and negative pressure isolation rooms designed specifically for its administration.

d. Personal Protective Equipment (PPE)

(1) Gloves. The thickness of the gloves used in handling HDs is more important than the type of material, although the best results have been observed with latex gloves. Gloves specifically made for handling hazardous drugs should be used (e.g., Chemobloc® gloves). Double gloving (wearing two pairs of gloves) is permitted when chemotherapeutic specific gloves are not available. Those individuals who may be allergic to latex should use double vinyl nitrile gloves. Because all gloves are permeable to some extent and their permeability increases with time, they should be changed regularly (i.e., hourly) or immediately if they are torn, punctured, or contaminated with a spill. Wash hands before gloves are put on and after they are removed.

(2) Gowns. A protective disposable gown made of lint-free, low-permeability fabric with a closed front, long sleeves, and elastic or knit-closed cuffs will be worn. The cuffs will be tucked under the gloves unless double gloving is specified. If double gloves are worn, the outer glove will be worn over the gown cuff and the inner glove under the gown cuff. Gowns and gloves used in the preparation area will not be worn outside the HD preparation area.

(3) Chemical Goggles and Face Shields. Whenever splashes, sprays, or aerosols of HDs may be generated, chemical-barrier face and eye protection will be used per reference (b). Eyewash facilities meeting reference (f) requirements must also be available.

(4) Respirator. Personnel administering aerosolized HDs should wear a NIOSH-approved N95, or greater, particulate respirator. Treatment areas should be designed to protect health care workers administering such drugs (see paragraph 6c(3)).

e. Caring for Patients Receiving HDs. Per reference (c), universal precautions must be observed to prevent contact with blood or other potentially infectious materials.

(1) Personnel dealing with any blood, body fluids, urine, or excreta from patients who have received HDs within the last 48 hours must wear approved gloves, face shields, and disposable gowns. Hands must be thoroughly washed after removal of PPE or after contact with the above substances.

(2) Linen contaminated with HDs, urine, or excreta from patients who have received HDs within the last 48 hours must be placed in specially marked impervious plastic laundry bags. Linen soiled with blood or other potentially infectious materials as well as contaminated with urine or excreta must also be managed according to reference (c).

(3) Reusable items such as glassware should be washed twice by trained employees using double gloving and a gown.

f. First Aid and Medical Surveillance

(1) In case of skin contact with HDs, do the following:

(a) Remove contaminated clothing immediately.

(b) Flush affected area with water for 15 minutes.

(c) Wash area with soap or other inactivator if the manufacturer specifies one.

(d) In case of eye contact with HDs, flush with water for a minimum of 15 minutes using equipment that meets reference (f). Continue irrigation until ophthalmologic examination is obtained.

(e) Report to an occupational health or emergency medicine provider for additional treatment and documentation of the exposure.

(f) Particular attention to the eyes, buccal (mouth) and nasal mucous membranes, and the skin will be included in the physical examination for acute exposures.

(2) Those personnel with potential exposure to HDs will be placed in the Medical Surveillance Program per reference (a), section VI. Selection of individuals for medical surveillance will be a collaborative effort between supervisors, safety, industrial hygiene, and occupational health. Medical surveillance will consist of pre-placement, periodic, situational (after acute exposure), and termination examinations per the Medical Surveillance Procedures Manual and Medical Matrix Series (reference (g)). An attempt should be made to minimize the number of personnel who work with these agents.

(3) In situations involving pregnant or breastfeeding personnel, references (g) through(j) should be consulted for guidance. Reproductive health issues will be incorporated into the hazard communication training for personnel with potential exposure to HDs.

(a) Breastfeeding women should not handle antineoplastics or work in areas where they are handled. These agents may contaminate surfaces in pharmacy drug preparation areas and drug administration areas and even occasionally penetrate gloves. The assessment of any of these types of exposures should be performed by a qualified IH in consult with appropriate medical staff (OEM, OB/GYN, Pharm D).

(b) The hazards of occupational exposure to antineoplastic agents were addressed by the National Study Commission on Cytotoxic Exposure. The following are excerpts from the Commission's statement on the handling of cytotoxic agents by women who are attempting to conceive, are pregnant, or are breastfeeding:

There are substantial data regarding the mutagenic, teratogenic and abortifacient properties of certain cytotoxic agents both in animals and humans who have received therapeutic doses of these agents. Additionally, the scientific literature suggests a possible association of occupational exposure to certain cytotoxic agents during the first trimester of pregnancy with fetal loss or malformation. These data suggest the need for caution when women who are pregnant or attempting to conceive, handle cytotoxic agents. . . . it is prudent that women who are breast feeding should exercise caution in handling cytotoxic agents. . . . Personnel should be provided with information to make an individual decision. This information should be provided in written form and it is advisable that a statement of understanding be signed. . . . It is essential to refer to individual state right-to-know laws to ensure compliance.

(c) Staff members who are pregnant, actively trying to conceive a child, or breastfeeding may be offered a transfer to duties that do not involve preparation or administration of HDs.

g. Spill Control

(1) A spill clean-up kit, clearly labeled, will be kept in each area where HDs are prepared, administered, or accumulated for disposal or transport. Vehicles transporting patients under active treatment with HDs will maintain the spill kit on the vehicle. See reference (a), section VI, chapter 2, paragraph V.C.5.e. for guidance on assembling spill kits.

(2) Clean-up of Spills. The American Society of Hospital Pharmacists (ASHP) considers small spills to be those less than 5 ml. The 5 ml volume of material should be used to categorize spills as large or small. Small spills, large spills, and spills in BSCs must be cleaned following reference (a), section VI, chapter 2, paragraphs V.C.5.b-d. Trained personnel wearing gowns, gloves, and splash goggles should clean up small spills.

(3) When a large spill occurs, the area should be isolated and aerosol generation avoided. The clean-up personnel should wear protective apparel available in the spill kit (including a NIOSH-approved respirator if there is any suspicion of airborne powder or that an aerosol has been or will be generated). Specific individuals should be trained to clean up large spills. Large spills should be immediately reported to the safety officer.

h. Disposal Procedures

(1) Thick, leak-proof plastic bags, colored differently from other hospital trash bags, should be used for the collection of used containers, discarded gloves, gowns, and any other disposable HD-contaminated material. Bags containing hazardous chemicals, as defined by reference (d), must be labeled following paragraph (f), *Labels and other forms of warning*. Where reference (d) does not apply, labels should indicate that bags contain HD-related waste.

(2) Needles, syringes, and breakable items should be placed in a sharps container before the container is placed in the waste bag. The waste bag should be kept in a covered container that is clearly labeled "HD Waste Only." At least one such receptacle should be located in every area where HDs are prepared or administered.

(3) HD-related wastes should be handled separately from other hospital trash and disposed of following EPA, State, and other local regulations for hazardous waste. While awaiting removal, the waste should be held in a secure area in covered, labeled drums with plastic liners.

i. Material Safety Data Sheets (MSDS). Per requirements in references (a) and (d), MSDSs for all covered HDs used at the activity must be maintained and readily accessible to employees. Each area where HDs are prepared or administered will maintain the appropriate MSDS(s).

j. Training and Information Dissemination

(1) In compliance with references (a) and (d), all personnel involved in any aspect of the handling of covered HDs (physicians, nurses, pharmacists, housekeepers, employees involved in

receiving, transport, or storage) will receive information and training to apprise them of the hazards of HDs present in the work area. Such information will be provided at the time of an employee's initial assignment to a work area where HDs are present and prior to assignments involving new hazards. Annual refresher information and training should be provided as well.

(2) Reference (a), section VIII provides the essential elements required for employee training. Training records should be maintained for 3 years from the date on which training occurred.

A handwritten signature in black ink that reads "A. M. Robinson, Jr." The signature is written in a cursive style with a large, prominent initial "R".

A. M. ROBINSON, JR.

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**COMMON DRUGS CONSIDERED HAZARDOUS BY THE
OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA)**

This list is not all-inclusive, should not be construed as complete, and represents an assessment of some, but not all, marketed drugs at this time.

ALTRETAMINE	INTERFERON-A
AMINOGLUTETHIMIDE	ISOTRETINOIN
AZATHIOPRINE	L-ASPARAGINASE
BLEOMYCIN	LEUPROLIDE
BUSULFAN	LEVAMISOLE
CARBOPLATIN	LOMUSTINE
CARMUSTINE	MECHLORETHAMINE
CHLORAMBUCIL	MEDROXYPROGESTERONE
CHLORAMPHENICOL	MEGESTROL
CHLOROTIANISENE	MELPHALAN
CHLOROZOTOCIN	MERCAPTOPYRINE
CISPLATIN	METHOTREXATE
CYCLOSPORIN	MITOMYCIN
CYCLOPHOSPHAMIDE	MITOTANE
CYTARRABINE	MITOXANTRONE
DACARBAZINE	NAFARELIN
DACTINOMYCIN	PENTAMIDINE
DAUNORUBICIN	PIPOBROMAN
DIETHYLSTILBESTROL	PLICAMYCIN
DOXORUBICIN	PROCARBAZINE
ESTRADIOL	RIBAVIRIN
ESTRAMUSTINE	STREPTOZOCIN
ETHINYL ESTRADIOL	TAMOXIFEN
ETOPOSIDE	TESTOLACTONE
FLOXURIDINE	THIOGUANINE
FLUOROURACIL	THIOTEPA
FLUTAMIDE	URACIL MUSTARD
GANCICLOVIR	VIDARABINE
HYDROXYUREA	VINBLASTINE
IDARUBICIN	VINCRISTINE
IFOSFAMIDE	ZIDOVUDINE (AZT)

EPA-REGULATED HAZARDOUS DRUGS

These hazardous drugs are cytotoxic drugs and are classified as hazardous wastes when they are to be discarded or are intended to be discarded. Any spill debris and the first voided urine from patients given bladder irrigation with these materials is also a hazardous waste and must be handled accordingly. These drugs are not to be intermingled. Each must be in a properly labeled container. The label must say "Hazardous Waste" and the name of the material. The containers are 1 to 5-gallon Department of Transportation (DOT)-approved plastic pails with lids.

DRUG	EPA WASTE #
Chlorambucil (Leukeran)	U035
Cyclophosphamide (Cytosan)	U058
Daunorubicin (Daunomycin)	U059
Diethylstilbestrol (Stilphostrol)	U089
Melphalan (Alkeran)	U150
Mitomycin C (Mutamycin)	U010
Dichlorodiphenyldichloroethane (ODD)	U060
Streptozocin	U206
Uracil Mustard	U237