

AFLOAT MEDICAL WASTE MANAGEMENT GUIDE



PREPARED BY
CHIEF OF NAVAL OPERATIONS
ENVIRONMENTAL PROTECTION, SAFETY
AND OCCUPATIONAL HEALTH DIVISION
(N45)

JUNE 1999

PREFACE

The Afloat Medical Waste Management Guide is intended for use by personnel involved in the handling, sterilization, storage, and disposal of shipboard medical waste. It is designed to provide simple, easily understood procedures to efficiently manage and control medical waste and prevent the incidence of improper disposal from Navy ships.

The Afloat Medical Waste Management Guide supplements and implements the policies established for shipboard medical waste in Chapter 19 of OPNAVINST 5090.1 Series. It was developed with the staffs of the Fleet Commanders in Chief and the Bureau of Medicine and Surgery. While all supporting individuals and organizations are not specifically identified, their efforts in the preparation of this publication are appreciated.

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1999 edition

Published by

Chief of Naval Operations

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON, D.C.: 1999

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I. INTRODUCTION

This publication incorporates all relevant policies into a single document that simplifies procedures and allows shipboard personnel to safely manage medical waste. The Navy's policy on the management of medical waste at shore medical and dental treatment facilities is contained in BUMED Instruction 6280.1A, *Management of Infectious Waste* (Reference 1), 21 January 1994. The Navy's medical waste policy for forces afloat is found in OPNAV Instruction 5090.1 Series, *Environmental And Natural Resources Program Manual* (Reference 2), Chapter 1 9.

This Afloat Medical Waste Management Guide contains current information gathered from sources in the U.S. Navy, the U.S. Environmental Protection Agency (EPA), and the Occupational Safety & Health Administration (OSHA). The guide also includes pertinent aspects of OSHA's Bloodborne Pathogens Standard as it applies to ships (e.g., personal exposure preventive measures, personal exposure control measures, and training requirements).

This publication defines and provides examples of medical wastes. It provides exposure control measures through the use of required warning labels, signs, color coding, and protective medical clothing and personal protective equipment (PPE). It establishes the type of training that personnel are required to have in order to work safely with infectious medical waste. The guide discusses specific shipboard procedures: segregation, handling, packaging, treatment, storage, and disposal for potentially infectious medical waste, non-infectious medical waste, and expired or unused medical materials. It, also provides procedures for cleanup of medical waste spills. Appendix A lists national stock number (NSN) information for approved medical waste supply items.

II. BACKGROUND

In December 1991, OSHA issued a standard for bloodborne pathogens. This standard is designed to protect personnel who can reasonably be anticipated to have occupational exposure to bloodborne pathogens. The primary bloodborne pathogens are human immunodeficiency virus (HIV) (the precursor to AIDS) and hepatitis B virus (HBV). HBV is the number one occupational infection among health care workers. Health care workers are also at risk of exposure to other bloodborne pathogens such as malaria and syphilis.

In recent years, the public has become increasingly concerned about the possibility of contracting diseases from exposure to medical wastes, particularly on public beaches. Reports of Navy medical waste washing up on beaches has adversely affected the Navy's public image. This publication was developed as a response to these incidents and to provide the Fleet with easily understandable information to supplement and implement the policies of OPNAV Instruction 5090.1 Series.

The Navy has developed technologies to address shipboard solid waste disposal problems such as plastics and rendering medical waste unidentifiable prior to disposal. Ships are now equipped with such devices as plastics waste processors, shredders, and pulpers, which should assist shipboard personnel when faced with the complex task of medical waste disposal.

Use the information in this guide to protect yourself and the environment.

III. MEDICAL WASTE CATEGORIES/SEGREGATION

A. Waste Segregation and Minimization

1. Medical waste shall be separated into infectious medical waste and noninfectious medical waste at its point of origin. Proper segregation will significantly reduce the quantity of infectious medical waste that must be processed and stored on board. Non-infectious medical waste, without sharps, can be disposed of as municipal solid waste pierside, and processed as normal ship's garbage underway, in accordance with 6PNAVINST 5090.1 series, Chapter 19.

2. Infectious medical waste shall be discarded directly into containers or plastic bags that are clearly identifiable and distinguishable from the municipal solid waste stream as described under Section IV C, Packaging.

3. Proper waste segregation should be included as an important part of medical waste training for surface ship and submarine personnel. Proper segregation of waste also minimizes storage space requirements, a very important consideration on both surface ships and submarines.

B. Infectious Medical Waste

Infectious medical waste is liquid or solid waste that contains pathogens in sufficient numbers and with sufficient virulence to cause infectious disease in susceptible hosts exposed to the waste. Examples are listed below:

1. Microbiology wastes include cultures and stocks of disease producing agents containing microbes that, due to their species, type, virulence, or concentration are known to cause disease in humans. Examples include specimens from medical and pathology laboratories; discarded live vaccines; wastes from biological testing; cultures and stocks of infectious agents from clinical laboratories; disposable culture dishes; and devices used to transfer, inject, and mix cultures.

2. Pathological wastes include human tissues and organs, amputated limbs or other body parts, and similar tissue from surgery procedures. Bedding exposed to pathogens is also included in this category.

3. Human blood wastes include human blood liquid waste, products of blood, items saturated or dripping with human blood, or items that were saturated or dripping with human blood that are now caked with dried human blood, devices used to contain blood or other body fluids (excluding urine that does not have visible blood in it). Absorbing materials that contain small amounts of blood or body fluids (e.g., small bandages and gauze pads) and discarded products for personal hygiene (e.g. facial tissues and sanitary napkins) are not considered infectious waste.

4. Sharps include hypodermic needles, syringes, scalpel blades, Pasteur pipettes, specimen slides, cover slips, glass petri plates, and broken glass potentially contaminated with infectious material.

5. Medical wastes from patients in isolation are often defined as infectious medical waste. However, only contaminated items were or items likely to be contaminated with infective material are infectious medical waste.

C. Non-infectious Medical Waste

Non-infectious medical waste includes disposable medical supplies and materials that do not fall into the categories of infectious medical waste. Examples include:

1. Used personal hygiene products such as facial tissues and sanitary napkins, unless the waste is from isolation rooms
2. Absorbent materials, not including waste from isolation rooms, containing small amounts of blood or body fluids
3. Disposable products used during routine medical or dental procedures (e.g., rubber gloves, rubber dams, 'Cotton and paper products, equipment trays, tubing and catheters)
4. Empty pill bottles and intravenous (IV) bags
5. Expired, unused culture tubes and plates
6. Packaging and overwrap

Definitions of terms related to infectious and non-infectious medical wastes are provided in Appendix B.

IV. SHIPBOARD PROCEDURES FOR INFECTIOUS MEDICAL WASTE

A. Handling Infectious Waste and Personnel Protection

1. Reference 1 directs commands to develop an exposure control plan which:
 - a. Identifies those at risk of exposure to infectious medical waste. Commands shall make a risk determination without regard to medical protective clothing and PPE usage.
 - b. Lists typical tasks' involving potential infectious medical waste exposure and identifies control measures in place to prevent or minimize exposure to infectious agents
 - c. Lists post-exposure evaluation and follow-up protocols
 - d. Addresses communication of hazards to employees
 - e. Lists record keeping procedures.

Personnel newly assigned to the medical department shall review the exposure control plan for training purposes.

2. The administration of hepatitis B vaccine series is now mandatory for all active duty medical personnel per Reference 3. Commands receiving medical personnel from other commands shall screen immunization records to ensure those personnel have received the complete vaccination series, and if not, schedule subsequent examinations.

3. Personnel who are injured while handling infectious medical waste shall report the incident promptly to the senior medical department representative. They shall immediately wash the injured area with soapy water if possible. The senior medical department representative shall assess the risk of infection to the worker and take appropriate medical follow-up action that may include booster shots. The senior medical department representative shall conduct an investigation to determine if any preventive measures should be implemented to prevent recurrence.

4. All personnel handling infectious medical waste shall wear gloves and additional protective medical clothing and PPE appropriate to the level of risk they encounter. Personnel shall remove any protective medical clothing and PPE used prior to leaving the work area and place it in a designated area or container until it can be properly laundered, decontaminated or disposed of. Protective medical clothing and PPE should not be submitted for laundering unless sterilized.

5. Personnel handling infectious medical waste should work in such a manner as to prevent contamination of their clothing or skin with infectious medical waste. Personnel should not attempt to pick up any potentially contaminated materials without wearing appropriate protective medical clothing and PPE (at a minimum, gloves).

6. Personnel shall not eat, smoke or drink while handling or being exposed to infectious medical waste.

7. Personnel should not pick up broken or potentially contaminated glassware directly with the hands. They should collect broken glassware using mechanical means such as brush and dustpan, tongs or forceps.

8. Medical personnel shall use the following safety precautions when handling sharps:

a. Discard sharps immediately after use into rigid, puncture resistant, autoclavable sharps containers that are labeled or color-coded as in paragraph IV.C.I. Refer to Appendix A for autoclavable sharps container NSNs.

b. Never clip, cut, bend, or recap needles

c. Close the sharps containers securely when they are 3/4 full. Do not overfill!

d. **All** sharps shall be retained in proper containers on board for proper disposal ashore after autoclaving. Place sharps containers in a second container (plastic bag or rigid box) which is labeled or color-coded. Collect the closed containers and transport them carefully to the treatment or storage site ashore.

9. When-performing procedures where splashing is not expected, gloves are the minimum PPE that may be worn. The following glove types may be used:

a. Medical grade latex or equivalent material gloves when handling infectious medical waste whenever the risk of glove deterioration (e.g., tearing, cracking, or puncturing) is minimal

b. Utility rubber gloves when there is a risk of hand or wrist injury. Utility rubber gloves may be worn and re-worn after decontamination provided the integrity of the glove is not compromised.

CAUTION

Personnel shall not use gloves if they are peeling, cracked, or discolored or if they have, punctures, tears, or other evidence of deterioration.

10. When performing procedures where smashing may occur or when infectious medical waste bags or containers may contact more than the worker's hands and wrists, the following medical protective clothing and PPE is required in addition to gloves:

a. Appropriate protective medical clothing such as, but not limited to, gowns, aprons, lab coats, clinic jackets, or similar outer garments as required by the anticipated level of exposure. Appropriate protective medical clothing is clothing that does not permit infectious medical waste from penetrating and reaching work clothes or skin

b. Eye protection, surgical face masks, and face shields when personnel may reasonably anticipate facial exposure to infectious medical waste

c. Refer to the Hazardous Materials User's Guide (HMUG) for further information on approved PPE (Appendix A: Shopping Guide).

11. Universal Precautions: An approach to infection control. According to the concept of Universal Precautions, personnel shall treat all human blood and certain human body fluids as if known to be infectious for HIV, HBV, and other bloodborne pathogens.

B. Infectious Medical Waste Spill Procedures

1. Ships' medical departments shall keep a spill containment and cleanup kit within the vicinity of the sickbay. Ship personnel shall use the kit to provide rapid and efficient cleanup of spills anywhere within the ship. The kit should consist of the following items:

a. Five gallons of material designed to absorb spilled liquids

b. One pint bottle of hospital grade disinfectant in a sprayer capable of being dispersed in a mist or a stream. Disinfectants shall be used according to directions on the label. Refer to Appendix A for product NSNs.

c. Approved biohazard plastic bags; new sets of disposable fluid-proof or fluid-resistant overalls, gloves, boots, caps, and protective face shields/masks; and tape for sealing wrists and ankles.

2. Personnel trained and equipped per this guide to work with infectious medical waste shall contain and clean up spills.

3. Personnel should wear appropriate protective medical clothing and PPE as noted in paragraph IV.A.9.

4. Personnel involved in the spill cleanup shall provide site control limiting access to the spill area to personnel only directly involved in the spill cleanup.

5. Using the spill containment and cleanup kit, cleanup personnel shall collect the spilled contaminant (i.e., blood or body fluid) with absorbent material and place all potentially infectious medical waste into approved biohazard plastic bags. They shall label the bags with a BIOHAZARD label for shore disposal. See Appendix A for approved biohazard bags.-

6. Personnel shall clean up the entire spill area using disinfectant detergent. Refer to Appendix A for NSN of disinfectant detergent.

7. If the source of the spill is damaged packaging, medical personnel should repackage the leaking container by placing it in an appropriate container slightly larger than the damaged one. They should properly label and store the material for disposal.

8. The senior medical representative shall appropriately document the spill incident in the ship's medical log, include the date, time, location, and quantity of spilled material.

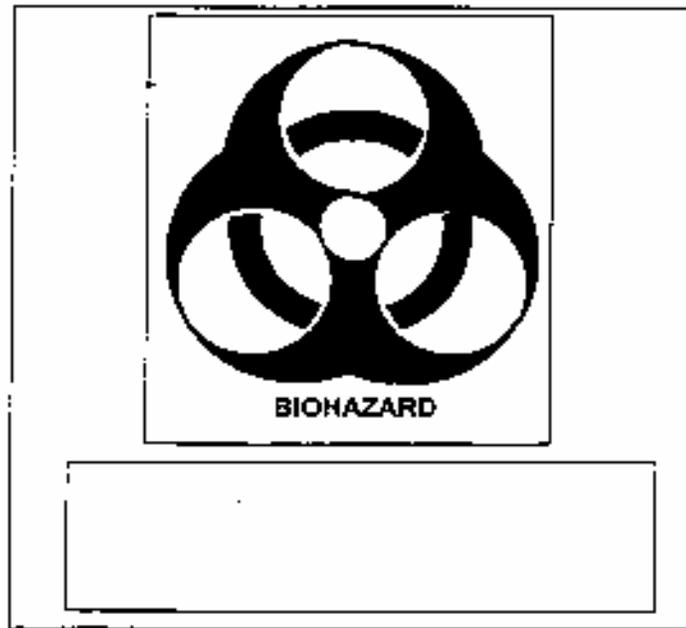
9. Personnel shall **immediately** report any exposure incident that occurs as the result of a spill or mishap cleanup to the responsible supervisor,.

C. Packaging Infectious Medical Waste. When packaging infectious medical waste, ship personnel shall:

1. Use the BIOHAZARD label to mark all infectious medical waste containers. This guide recommends the use of standard national stock preprinted biohazard bags. (NSNs for these labels and bags are identified in Appendix A). If standard preprinted biohazard bags or labels are not available, use red containers marked with the universal biohazard symbol or the word "BIOHAZARD".

- a. The labels shall be fluorescent orange or orange-red with lettering or symbols in a contrasting color.
 - b. Personnel shall fix labels as close and securely to containers and bags as feasible using string, wire, or adhesive if they are not already preprinted on the containers and bags.
2. Place the infectious medical waste into a puncture-resistant container or autoclavable plastic bags of sufficient thickness, durability, puncture resistance, and burst strength to prevent rupture or leaks. Appendix A lists the NSNs for two different sizes of preprinted BIOHAZARD bags.

BIOHAZARD Sign with Universal BIOHAZARD Symbol:



3. Plastic bags should be a minimum of 3 millimeters thick and of sufficient quality so that only one bag is needed for most situations. Secure the bags and mark the infectious medical waste clearly with the universal biohazard symbol and the word "BIOHAZARD". The marking shall identify the generator, date of generation, and contents per section IV.D. Do not overload bags. Wet and/or leaking bags shall be double-bagged.

4. Ensure infectious medical waste containers are covered and sealed before and during transport to treatment or storage areas. Do not transport infectious medical waste in chutes or dumbwaiters. Use rigid or semi-rigid, leak-proof containers for infectious medical waste transport. Keep human exposure to medical infectious waste to a minimum.

5. All anatomical pathology waste is to be placed into a double-wail corrugated box or equivalent rigid container that is double-lined with plastic bags for storage, transport and incineration, cremation, or burial by a licensed mortician. Clearly label containers per paragraph IV.C.1 and store in accordance with paragraph IV.E.

D. Treatment of Infectious Waste. To treat ships infectious waste properly, medical personnel shall:

1. Treat (sterilize) infectious medical waste as soon as possible to avoid cross-contamination of medical spaces.

2. Steam sterilize infectious medical waste within four days of the date of generation. Package sterilized waste appropriately and store for disposal ashore or incinerate if the waste is paper and cloth-based and the ship is equipped with an incinerator.

3. Treat or render infectious medical waste non-infectious prior to storage or transfer/disposal, (except liquids that can be safely discharged into the sanitary system per Table One).

a. **Steam Sterilization.** Autoclaving is the only method currently approved for treating shipboard infectious medical waste. Refer to Appendix A for a list of NSNs of approved shipboard autoclaves. Personnel should sterilize infectious medical waste at non-peak hours to minimize the risk of cross-contamination. Place infectious medical waste into a puncture-resistant container or double bag it in autoclavable plastic bags of sufficient thickness, durability, puncture resistance, and burst strength to prevent rupture or leaks and place in autoclavable trays to minimize damage to the interior of the autoclave. Personnel shall vent each bag (including each bag of a two-bag set, when double bagged) with a cotton or gauze plug to ensure steam exchange into each bag for both effective sterilization and steam pressure equalization. They should only autoclave infectious medical waste on the "11 slow exhaust" or "liquids" cycle to prevent bags from bursting and soiling the autoclave. They should only place sharps containers in a second container (puncture resistant container or impervious plastic bag) which is properly labeled or colored before treatment and disposal.

NOTE

The requirement for steam sterilization does not apply to submarines or surface ships with installed: autoclaves smaller than 16' x 26' x 16'.

b. For effective sterilization, personnel must maintain the autoclave temperature at 121 °C (250 °F) for at least 90 minutes at 15 pounds per square inch of gauge pressure.

c. Each bag of waste treated shall have chemical indicator tape attached to ensure that proper sterilization temperatures have been reached. Medical department personnel should evaluate autoclaves for effectiveness on a weekly basis, while under full loading conditions, with *Bacillus stearothermophilus* spore strips (see Appendix A for the NSNs for chemical indicator tape and spore strips).

d. Personnel should not operate autoclaves in port for treatment of infectious medical waste. When the ship is in port, they should promptly transfer waste to a shore medical support activity for treatment. Ship medical departments should only operate autoclaves in port to sterilize instruments, etc.

E. Infectious Waste Storage. Ships medical department personnel involved in infectious waste stowage shall:

1. Store infectious medical waste separately from all hazardous material.

2. Store infectious medical waste only in suitably marked containers in a designated storage area located near the sickbay but away from patient care, berthing or foodservice areas. In accomplishing this, medical department personnel shall:

a. Not store infectious medical waste in the same refrigerator, freezer, or other storage area with medications, supplies or food. If required to refrigerate or freeze infectious medical waste, remove food, medications and supply items.

b. Keep storage areas clean.

c. Ensure the universal biohazard symbol and the word 'BIOHAZARD' is clearly visible on the outside of the storage area.

d. Limit access to the storage area to authorized personnel specifically designated to handle infectious medical waste.

3. Keep storage time of untreated infectious medical waste (with no refrigeration capability) to a minimum, not to exceed four days.

F. Infectious Waste Disposal

1. Ships may incinerate infectious paper and cloth-based medical wastes that have been steam sterilized if properly equipped to do so. Ships should not incinerate infectious medical waste with a high moisture content or containing plastic.

2. Ships shall package and label infectious medical waste that is to be transferred for disposal ashore as described in paragraph IV.C. They shall place sharps containers in a separate container from other waste (either a puncture resistant container or impervious plastic bag).

3. Ship personnel may discharge blood, blood products, and other liquid infectious medical wastes into the marine sanitation device (MSD), preferably through a laboratory type sink. Ships should designate one sink for this purpose and label with a placard warning users to only dispose of blood, blood products, and liquid infectious waste when the ship is greater than 50 nautical miles from shore. Personnel should consider the emptied containers to be infectious medical waste and package accordingly. They should place bulk blood, which cannot be emptied safely (e.g., pleurovacs and hemovacs), into leak-proof containers that clearly display the universal biohazard symbol and the word "BIOHAZARD" or are color-coded red.

4. Transportation and Shore Disposal. **Normally, ships shall only dispose of infectious medical waste at Navy facilities within the U.S. and around the world.** Ships shall make prior arrangements with appropriate shore facilities (normally the base environmental office in Navy ports, and the port services officer at non-Navy ports) that accept infectious medical waste. When required to transport infectious medical waste to a collection site (not over non-military public streets and roads), ship's personnel shall safely package the materials per paragraph IV.C, use a government vehicle, and assign a person trained to work with infectious medical waste to accompany the waste package.

5. At Sea Disposal. If retention of infectious medical waste endangers the health or safety of personnel on board or compromises combat readiness, the commanding officer or master may authorize overboard discharge beyond 50 nautical miles from shore. Discharged waste must not contain plastic or sharps and must be steam sterilized, rendered unrecognizable, properly packaged and weighted for negative buoyancy. The ship shall ensure that a deck log entry is made indicating the reason for disposal, the amount of waste, ship's position, and time of disposal. The

ship's commanding officer or master must specifically approve all disposal of infectious medical waste at sea.

NOTE

The overboard discharge of **sharps** and plastics is prohibited.

G. Infectious Medical Waste Management in Foreign Countries

In foreign countries, the procedures for packaging, handling, storage, transport, treatment, and disposal of infectious medical waste shall be consistent with the standards to protect public health and the environment prescribed by applicable Status Of Forces Agreements (SOFAS) or international agreements. If no SOFA or international agreement exists, infectious medical waste shall be disposed of as specified by the cognizant Fleet Commander.

H. Infectious Medical Waste Training

All shipboard personnel working with infectious medical waste or material contaminated with infectious medical waste shall receive training on all aspects of handling infectious medical -waste to ensure they know how to properly protect themselves. The training, at a minimum, shall cover the material found in this guide and shall at least include an explanation and discussion of the following:

1. Epidemiology and symptoms of bloodborne diseases
2. Modes of transmission of bloodborne pathogens
3. Recognize work assignments and details (e.g., segregation, autoclaving, and transportation) that may expose personnel to infectious medical waste.
4. How to avoid potential disease transmission while handling infectious medical waste
5. How to safely segregate, handle, treat, store, and dispose of infectious medical waste
6. Emergency response infectious medical waste management procedures

7. The basis for selection of personal protective equipment (PPE)
8. The proper use, care, and disposal of personal protective equipment
9. Post-exposure incident medical follow-up reporting procedures
10. Required signs and labels
11. An explanation of the Exposure Control Plan and the means by which a person can obtain a copy of the written plan. The Exposure Control Plan is designed to eliminate or minimize personal exposure. This plan shall be readily accessible.

The training sessions should include an opportunity for interactive questions and answers with the person administering the training.

Personnel shall receive training upon assignment to an area where exposure is possible and annually thereafter. Division training records should document this training.

Ships shall provide additional training when changes such as modification of tasks or procedures or institution of new tasks or procedures affect the Sailor's occupational exposure. They may limit this additional training to addressing the new exposures created.

I. Infectious Medical Waste Recordkeeping

Ships shall develop a system to track shipboard storage and disposal of infectious medical waste. Ships shall use a DD-1 348-1 A offload document for turning in material to the supply system ashore. Information should include date, type of waste, amount (volume or weight), storage location, and method of disposal. Recordkeeping should be done within the Medical Department Journal.

NOTE:

The Board of Inspection and Survey, Type Commanders, and the Naval Safety Center will ensure recordkeeping is accomplished, via oversight inspections, assist visits and surveys.

Table 1

Summary of Shipboard Infectious Medical Waste Requirements

Infectious Waste Type	Package/Handling	Treatment/Storage ¹	Disposal ²
Sharps	Discard into rigid, puncture resistant sharps container. Never clip, cut, bend, or recap needles. Label BIOHAZARDOUS. Seal containers when $\frac{3}{4}$ full.	Autoclave and store.	Shoreside.
Fluids (blood, blood products, and other liquid infectious waste)	Decant fluids to sanitary system. Bulk blood that cannot be emptied safely into the sanitary sewer should be placed in leak-proof containers. Empty containers should be considered infectious. Label BIOHAZARDOUS.	Blood, blood products, and other liquid infectious wastes may be discharged into the ship's marine sanitation device (MSD) system. Otherwise autoclave and store in leak-proof containers.	Ship's MSD or shoreside.
Pathological Waste	Place in containers double lined with leak-proof plastic bags. Label BIOHAZARDOUS.	Logistical and ethical constraints may require freezing this waste.	Shoreside.
Materials Saturated With Blood or Blood Products	Place in containers double lined with leak-proof plastic bags.		
Other Infectious Wastes (surgical, isolation wastes, cultures, and associated biological)	Place in containers lined with leak-proof plastic bags. Label BIOHAZARDOUS.	Autoclave or incinerate and store.	Shoreside or incineration. ³
¹ The requirement to autoclave does not apply to submarines or surface ships with autoclaves smaller than 16"X26"X16". ² Shoreside disposal shall be in accordance with the shore facility, federal, state, and local requirements. ³ Plastics may not be incinerated.			

V. SHIPBOARD PROCEDURES FOR MANAGING AND DISPOSING OF NON-INFECTIOUS MEDICAL WASTE

A. Waste Segregation

Effective segregation of infectious medical waste from non-infectious medical waste at the point of origin will minimize the quantity of generated infectious waste and the time required its management and disposal. Since non-infectious waste does not pose significant adverse health risks to personnel, the personal exposure control and preventive measures described in section IV do not apply to non-infectious medical waste.

B. Handling, Treatment, Storage and Disposal of Non-Infectious Medical Waste

Ships shall treat non-infectious medical waste as solid waste. As such, this waste does not require autoclaving or special handling. Ships' medical personnel should segregate this waste into plastic and non-plastic waste, place it into the appropriate trash receptacles, and discard it with other municipal solid waste in port. At sea, ships can process non-infectious waste not containing sharps or plastic as normal ship's garbage and dispose of it underway, in accordance with OPNAVINST 5090.1 series, Chapter 19. Ships should hold plastic waste for shore disposal. They should use sharps containers for disposal of all sharps, and hold sharps for shore disposal or process on board and stored for shore disposal.

1. Navy Shipboard Solid -Waste Equipment. Medical personnel may use the following shipboard equipment designed for solid waste processing for disposal of appropriate non-infectious medical waste. Each piece of equipment renders all waste unrecognizable. At-sea disposal requirements for non-infectious medical waste are the same as for any solid waste (see Reference 2).

a. Pulper. The pulper grinds pulpable materials, such as paper, cardboard, and food wastes, into a 2% slurry for direct overboard disposal when the ship is beyond 3 nautical miles from shore. The pulper does not process metal, wood, fabrics, or plastics.

b. Plastics Waste Processor. The plastics waste processor is composed of a plastic shredder, a compress melt unit, and a closed loop-cooling unit. This equipment shreds, compresses, and melts plastic waste into a solid disk, which is stored aboard ship for disposal ashore.

c. Solid Waste Shredder. The solid waste shredder processes glass and metal containers (primarily food cans) for proper disposal. Two counterrotating shafts with converging blades shred the waste in a shredding chamber. The shredded material then drops into a collection area where the metal and glass are placed in a burlap, sinkable bag. Shredders are dedicated to either 'plastic', or 'metal and glass' to prevent inadvertent disposal of plastics at sea.

2. Incineration Equipment

a. Incinerator. The standard Navy shipboard incinerator is installed on some ships. The incinerator can be used for the disposal of both infectious waste after sterilization and non-infectious medical waste, but only if the waste is paper or cloth-based. Ships shall observe the following guidelines for incineration of noninfectious medical waste :

- (1) Incinerate non-infectious paper waste with general trash.
- (2) Do not incinerate non-infectious plastic materials.
- (3) Never place sharps into the incinerator.
- (4) Do not incinerate non-infectious medical waste with high moisture content.
- (5) Dispose of Incinerator ash of in accordance with requirements for non-pulped solid wastes.
- (6) Transport noninfectious medical waste to the incinerator in leak-proof, puncture-resistant containers by trained personnel.

Table 2

Summary of Shipboard Non-infectious Medical Waste Requirements

Non-infectious Waste	Packaging/Handling	Treatment/Storage	Disposal ¹
Plastic	Package and handle like plastic general waste.	Store for shoreside disposal or use plastic waste processor (PWP) and store for disposal ashore.	Shoreside.
Nonplastic	Package and handle like general solid waste.	Shred or pulp, or incinerate when appropriate. Store with general waste.	Incinerate or overboard discharge (use solid waste processing equipment to render unrecognizable).
Expired and Unused Medical Supplies	Separate plastics, package for shore disposal.	Store for shoreside disposal.	Shoreside.

¹ Shoreside disposal shall be in accordance with the shore facility, federal, state, and local requirements.

VI. SHIPBOARD PROCEDURES FOR EXPIRED AND UNUSED MEDICAL MATERIALS

Prior to leaving port, ships' medical departments shall dispose of expired medical materials. While in port, ships should evaluate medical materials and contact NAVMEDLOGCOM, Marketing, Customer Support Department, to determine if the shelflife of some medicines can be extended. They can be contacted by phone (301) 619-3086, DSN 343-3086, or on their website at <http://www-nmlc.med.navy.mil/>. Those medical materials, which expire during deployment, shall be retained onboard ship for disposal ashore or proper disposal at sea.

A. Material that could be used as narcotics paraphernalia. - Ships shall handle and store expired or unused materials that could be used as narcotics paraphernalia (i.e., hypodermic needles, syringes, IV administration/injection sets, blood collecting sets) intended for disposal with the same security as required for narcotics and other controlled substances. Destroying or disabling this material will not enable its disposal as ordinary trash this material must be disposed of in port (however plastic material may be shredded and processed in the plastics waste processor). Ships

should contain unused sharps in rigid, puncture-resistant sharps containers and stored for shoreside disposal.

B. Creams, and ointments. - Personnel shall empty the content of tubes or jars into the ship's sanitation system through a toilet that does not have a trap that can become clogged. They shall dispose of the empty containers as regular trash. They should hold large quantities for shoreside disposal.

C. Tablets, capsules, powder. - Medical personnel should remove material from the original container, crush or break tablets and capsules, and dispose of in a commode. They may dispose of non-plastic containers as regular trash provided the containers can be rendered unrecognizable. Ships must hold plastic containers on board for shore disposal; however, they may shred the containers and process in the plastics waste processor. **(NOTE: To prevent clogging, do not pour soluble fiber (e.g., Metamucil) down drains)**

APPENDIX A**Approved Supply Items For Shipboard Medical Waste Management**

Item	National Stock Number
Biohazard Bags 26" x 18"/pkg. of 200 (Autoclavable)	6530-01-107-5799
Biohazard Bags 36" x 24"/pkg. of 100 (Autoclavable)	6530-01-107-5798
Biohazard Labels	6530-01-280-2931
Sharps Containers (Autoclavable)	6530-02-200-3022
Bacillus stearothermophilus Spore Strips	6530-00-477-6720
Disinfectant, Germicidal Fungicidal Concentrate (Non-phenolic type)	6840-00-753-4797
	7930-01-378-4561
	7930-01-378-4564
	7930-01-379-5269
7930-01-379-5692	
Chemical Indicator Tape (for proper sterilization temperature)	6530-01-174-2368
Sterilizers ^{1,2} Portable, counter top installed sterilizers (inside dimensions W x L x H) 16" x 26" x 16" 20" x 38" x 20"	6530-01-340-8001
	6530-01-142-8235
	6530-01-137-8475
Notes: ¹ Permanent installation requires hard mount plumbing. ² Check with Naval Medical Logistics Command for verification of overall sterilizer sizing and capabilities. - Commercial (301) 619-7247 - DSN 343-7247 - POC Senior Biomedical Equipment Repair Technician or Biomedical Equipment Engineering	

APPENDIX B

Definitions

Blood: Human blood, human blood components, and products made from human blood.

Bloodborne Pathogens: Pathogenic microorganisms that are present in human blood and can cause disease in humans. These pathogens (disease agents) include, but are not limited to, Hepatitis B Virus (HBV) and Human Immunodeficiency Virus (HIV), malaria, and syphilis.

Contaminated: The presence or the reasonably anticipated presence of blood or other potentially infectious materials on an item or surface.

Contaminated Laundry: Laundry, which has been soiled with blood or other potentially infectious materials or may contain sharps.

Contaminated Sharps: Contaminated objects that can penetrate the skin including, but not limited to, needles, scalpels, broken glass, broken capillary tubes, and exposed ends of dental wires.

Decontamination: The use of physical or chemical means to remove, inactivate, or destroy bloodborne pathogens on a surface or item to the point where they are no longer capable of transmitting infectious particles and the surface or item is rendered safe for handling, use, or disposal.

Disinfectant: A chemical agent used for decontamination. An agent that frees from infection.

Exposure Incident: A specific eye, mouth, other mucous membrane, non-intact skin, or parenteral contact with blood or other potentially infectious materials that results from the performance of an employee's duties.

HBV: Hepatitis B Virus. The disease can produce a mild to chronic infection, liver damage such as cirrhosis, liver cancer, or death due to liver failure.

HIV: Human Immunodeficiency Virus, the precursor to Acquired Immunodeficiency Syndrome (AIDS).

Infectious Medical Waste: Infectious medical waste is liquid or solid waste that contains pathogens in sufficient numbers and with sufficient virulence to cause infectious disease in susceptible hosts exposed to the waste.

Negatively Buoyant: Describes an object whose weight is sufficient to sink it.

Sterilize: The use of a physical or chemical procedure to destroy all microbial life including highly resistant bacterial endospore.

Universal Precautions: An approach to infection control. According to the concept of Universal Precautions, all human blood and certain human body fluids are treated as if known to be infectious for HIV, HBV, and other bloodborne pathogens.

Unrecognizable: The process of rendering waste unidentifiable by shredding, grinding or other mechanical means.

APPENDIX C

References

The following documentation was used to develop the Afloat Medical Waste Management Guide:

1. BUMED Note 6230 of 20 April 1998
2. BUMEDINST 6280.I A, Management of Infectious Waste, 21 January 1994.
3. OPNAVINST 5090.1, Environmental and Natural Resources Program Manual 2 February 1 998.
4. OPNAVINST P-45-110-96, Hazardous Material User's Guide of October 1996