TIP No. 045-1224

Disposal of Regulated Medical Waste During Deployment

PURPOSE.

This paper has been prepared to assist military personnel in answering frequently asked questions regarding the disposal of medical waste during operational and training deployment settings. It is a quick source of information that will be updated as regulations and policies are promulgated and presents the Defense Centers for Public Health – Aberdeen (DCPH-A) perspective on acceptable medical waste disposal practices. The goal is to protect waste handlers, render medical waste non-infectious, prevent access by scavengers and vectors, and to safely dispose of it.

REFERENCES.

Department of Defense (DoD). 2013. Instruction 4715.05, *Environmental Compliance at Installations Outside the United States*.

DoD. 2016. Instruction 4715.22, *Environmental Management Policy for Contingency Locations*.

DoD. 2020. Manual 4715.05, Volume 5, *Overseas Environmental Baseline Guidance Document, Waste*.

Department of the Army. 2019. Technical Manual 3-34.56/Marine Corps Reference Publication 3-40B.7, *Waste Management for Deployed Forces*.

BACKGROUND.

Proper management and disposal of field waste, including medical waste, is critical in protecting the health of Soldiers and the environment in deployed settings. Medical waste is any waste that is generated in the diagnosis, treatment, research, or immunization of human beings or animals that is potentially capable of causing disease or may pose a risk to either individuals or community health if not handled or treated properly. Terminology will vary based on locality, so medical waste may also be called regulated medical waste, infectious waste, biohazard waste, clinical waste, etc.

WASTE GENERATION AND SEGREGATION.

Separate infectious medical waste, if practical, from other solid waste at the point of origin.

- Collect infectious medical waste in red bags or receptacles that are a minimum of 3-mils thick and have durability, puncture resistance, and burst strength as to prevent rupture or leaks during ordinary use.

- Clearly mark all bags or receptacles used to segregate, transport, or store infectious medical waste with 1) The universal biohazard symbol, 2) The word “BIOHAZARD” in English and the predominant host nation (HN) language, and 3) Markings or a label that identify the generator, date of generation, and contents.

- Collect sharps in upright, rigid, puncture-resistant containers with tight-fitting, leak-resistant lids. Close sharps containers and remove them when they are three-fourths full.

- Handle mixtures of infectious medical wastes and hazardous wastes as infectious hazardous waste according to Volume 4 of DoDM 4160.21. The hazardous waste priority presents the greatest risk; however, treatment of the infectious component may be required to render the waste non-infectious, per the responsible DoD medical authority, prior to hazardous waste management.

- Handle mixtures of other solid waste and infectious medical waste as infectious medical waste.

- Segregate waste generated during treatment of a patient (human or animal) for a Category A infectious substance from medical waste and manage Category A treatment wastes according to regulations of the HN and the International Air Transport Association.

HANDLING. Ensure all personnel handling infectious medical waste wear appropriate protective apparel or equipment such as gloves; coveralls; masks; and goggles and receive appropriate training on the use of protective equipment and risk reduction associated with exposure to infectious agents, pathogens, and physical hazards.

STORAGE. Manage infectious waste when stored onsite in a manner that prevents decay, spoilage, and entry of insects, rodents, or other pests. Refrigeration is preferred for pathological waste (organs, tissue, etc.) when available. Ensure that unauthorized personnel are prevented from accessing storage sites. Ensure storage sites are marked with the universal biohazard symbol (in color or lettering that is easily visible to all) and the word “biohazard” in English and the HN language.

TREATMENT AND DISPOSAL.

Treat and dispose of blood, blood products, and other liquid infectious wastes as follows:

- Decant bulk blood and blood products into a sewer system connection (e.g., sinks, drains), unless pre-treatment is required. If pre-treatment is required, use approved methods in theater guidance before discharge to the sewer system. Continue to manage the emptied containers as infectious medical waste.

- If pre-treatment is not feasible to allow for sewer system disposal, seal the liquid waste in leak-proof containers and manage with solid medical waste.

If contract removal has not been coordinated in theater, treat solid infectious medical waste according to theater guidance with approved treatment technologies (incineration, chemical disinfection, steam sterilization). Note: pathological waste requires incineration/cremation.

- Design and operate incinerators used to treat infectious medical waste to maintain a minimum temperature and retention time sufficient to destroy all infectious agents and pathogens and meet the applicable air emission standards specified in theater guidance and the Overseas Environmental Baseline Guidance Document (OEBGD), Volume 2.

- Ensure sterilizers maintain their temperature at 121 °C [250 °F] for at least 30 minutes at 103.4 kilopascal [15 pounds per square inch]. Check the effectiveness of sterilizers at least weekly using *Bacillus stearo thermophilus* spore strips or an equivalent biological performance test.

- When using chemical disinfection, allow the required contact time specified on the manufacturer provided label and ensure all surfaces are in full contact with the disinfectant for the full contact time.

RECORDKEEPING. Maintain medical waste treatment records detailing the—

- Type of waste.

- Amount of waste (volume or weight).

- Treatment method, including date of treatment.

- Final disposal/disposition method (e.g., date picked up by contractor, how much is picked up, who picked it up; or, if buried, where it was buried in HN, how much was buried, how and when it was transferred).

FREQUENTLY ASKED QUESTIONS.

Q1: What means are available to treat and destroy medical waste (to include untreated sharps)?

A1: (a) Ideally, units will use a high-quality incinerator (local hospital, contractor, or other source) or some other modern means of treating and destroying medical waste. If there are no treatment devices or DoD-approved contracts for removal, onsite treatment can be accomplished constructed treatment devices. The inclined-plane burner is currently the best available, field-expedient means to treat and destroy medical waste, including sharps. The inclined-plane burner is described in Chapter 3 and shown in Figure 3-3 of TM 3-34.56/MCRP 3-40B.7.

(b) To ensure maximum treatment capacity, mix the waste feed to the inclined-plane incinerator at approximately 10% by weight of medical waste (to include sharps) to 90% by weight of regular trash. This mixture will help assure the hottest and cleanest burn possible.

(c) Incineration and burn activities should be conducted as far downwind as possible (at least 450 feet) from inhabited areas, i.e., avoid burn activities when the wind will blow the resulting smoke toward the base camp or other inhabited areas.

(d) Use of the inclined-plane incinerator is considered “open burning,” and requires theater approval for use. This kind of treatment is a “field expedient,” and should be used only if preferred means for treatment and disposal (approved technology or contract removal) do not exist.

(e) Retrograding untreated or sterilized medical waste to CONUS is discouraged and should be thought of as a “last resort” when there is no other way to dispose of or manage it. Importing foreign vectors into the U.S. must be avoided. Putrefaction (horrible odors) at the receiving end is also an issue.

Q2: How should the ash from the incinerator be disposed?

A2: Ash from incineration/treatment must always be evaluated for heavy metals and hazardous waste criteria. Typical theater waste management requires containerizing the treated ash in 55-gallon drums. Dependent on the ash sample results, manage as hazardous waste or solid waste according to theater guidance. When at all possible, manage the ash disposal in theater. If the ash cannot be disposed properly in theater (via contracted landfill or government operated landfill), it must be stored until approved for retrograde to the United States or an allied country for approved disposal.

Q3: What about burying ash with sharps below "scavenging level?"

A3: Scavenging at landfills in theater cannot effectively be stopped or prevented after U.S. Forces depart. It can be prevented with DoD-approved HN landfill agreements that incorporate deep burial and sealed top cover. To prevent scavenging of treated medical waste, coordinate with the DoD Defense Logistics Agency Disposition Services to turn in containerized, treated medical waste ash. The containers may be staged in secured areas while the DLA coordinates appropriate waste management in theater or appropriate retrograde actions.

Q4: How can infectious medical waste be disposed of if an incinerator is not available?

A4: (a) Steam sterilization, also known as autoclaving, is another viable treatment for medical waste. Considerations include water supply, power supply, the chamber size of the sterilizer unit, and the time in between sterilization runs. Additionally, use of a sterilizer for waste will prohibit its use for all future equipment sterilization. If used to sterilize waste, a field medical sterilizer **MUST** be permanently marked and labeled as being dedicated for ONLY sterilizing waste. When sterilizers are used to treat medical waste, autoclave bags must be used to allow the steam to make contact with the contaminated materials. Once the medical waste has been sterilized and cooled, the waste should be managed as regular trash (protection given to minimize people getting cut when handling it). Note: most sterilizer chambers are not large enough to facilitate treatment of multiple red bags and sharps containers full of waste, and they require a lot of energy and water.

(b) If use of a medical waste incinerator or sterilization is not possible, medical waste may have to be transported to a sustainment area where the appropriate facilities are available. These movements must be coordinated with higher headquarters to ensure compliance with any governing international agreements.

Q5: What about sharps that have been steam sterilized?

A5: As with incinerator ash, the treated sharps from the sterilizer should be managed according to theater guidance, containerized, stored, and turned in through DLA Disposition services for approved in theater disposal or coordinated retrograde. A medical authority must sign a paper indicating the sharps were appropriately treated and are no longer infectious. Note: DLA Disposition services will not accept custody of sharps but will assist with required disposal coordination

Q6: What types of personal protective equipment should be used when burning medical waste?

A6: Soldiers should wear both skin protection and respiratory protection when burning medical waste. A paper surgical mask does not protect from hazards inherent in the burning of waste; to wear them leads to a false sense of benefit. Although the Soldiers' "gas mask" has a HEPA filter, it would be an improper use of the "gas mask" to have Soldiers wear it while burning medical waste. Furthermore, it would send a misleading visual message to the public to see Soldiers wearing the military "gas mask" when burning waste. Air purifying respirators (cartridge or canister) with HEPA filters are recommended, if available.

POINT OF CONTACT.
For additional information, contact the DCPH-A, Environmental Health Sciences Division, Waste Management Branch at 410-417-1337.